WARFARE AS AN AGENT OF CULTURE CHANGE:
THE ARCHAEOLOGY OF GUERRILLA WARFARE ON THE
19TH CENTURY MISSOURI/KANSAS BORDER

BY


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Chairperson, John W. Hoopes, Ph.D.

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## ABSTRACT

Within the last decade, anthropologists have begun to re-evaluate warfare as an influence on social organization and cultural change. Once considered relatively inconsequential in pre- and non-state societies, key studies in archaeology suggest that war has an important role to play in understanding cultural behavior across time and space. An emerging body of theory relates modes of warfare to predictable patterns of socio-economic behavior, testable through archaeological and historical data.

Archaeological data from Bates County, Missouri offers a valuable context for evaluating this body of theory. The Missouri-Kansas Border War of 1855 to 1865 was like no other in American history. Clashing social, economic and racial sentiments of the 19th century erupted into partisan violence so merciless that it eroded civil society itself, eventually leaving a sizable region torched and depopulated. Guerilla warfare in this area more closely resembled the so-called "primitive war" reflected in pre-state archaeological records than the patterns of violence typically associated with Civil War battlefields. Bates County, owing to its essential total depopulation and destruction in the wake of guerilla warfare, affords a virtually unique context for archaeological pattern recognition.

This research investigates the socio-economic responses of households to this style of warfare, including restrictions on provisioning, contraction of trade networks, and the militarization of household economy as reflected in weapons technology. With its focus on the domestic impacts of warfare, this research evaluates important models of warfare and complements understandings of the American Civil War known largely on the basis of episodic historic evidence.

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*This work is dedicated to*
*Nita & Doug Thompson, Peggy Buhr, Donna & Randy Gregory, Melissa Phillips,*
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*This work is also dedicated to the memory of my Uncle Bill. He left us right at the start of this project, but I know he is probably looking down right now and saying,*
*"Way to go, Punkin'!"*

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*"It takes very special qualities to devote one's life to problems with no attainable solutions and to poking around in dead people's garbage: Words like 'masochistic', 'nosy,' and 'completely batty' spring to mind."*
Paul Bahn. 1989. *Bluff Your Way in Archaeology*. Ravette Books, West Sussex.

## *Introduction*

### Beginning Work in Bates County

In June 2007, I made a presentation at the Bates County History Museum about the Missouri/Kansas Border War, General Order No. 11, and what archaeology could contribute to understanding these events. Knowing the history of this period and this region as I did, and knowing also that I was a Missourian doing research at a Kansas institution, it was not without some trepidation that I began my presentation. Its primary goal was to make a case for the story Bates County had yet to tell regarding these events – a story still in the ground. In order to do my research, I needed access to viable archaeological sites and the demographics of the county meant that these sites were most likely going to be on private property. The thought of letting a stranger have access to one's property in order to dig up the remains of a time period and event that caused so much pain and anguish could be unsetting to many people and I was acutely aware of these sensitivities. I knew I would have to strike the right balance in order to gain the trust of the county's residents if they were to allow me the privilege of telling a part of their story.

During the course of my presentation, I attempted to give an even-handed treatment of the events in question, trying to read the audience's reaction as I went. They were attentive but stoic as I discussed events (such as the Kansas City jail collapse) that

usually receive little notice in popular accounts of the Border War. Many of them nodded at familiar references, but in general there was little outward reaction. During the question and answer period at the end of the presentation, the personal connection to these events came through.

Many of the audience members were over the age of fifty and professed long family histories in the county. In addition to the expected questions about how the archaeological research would be conducted and its direct impact on their properties, I was offered many stories and anecdotes about the impact of the events of the 19th century on their families. The main theme that emerged was one of an enduring and passionate connection to these events and a frustration about how they had been recounted in the century and a half since they had happened. The Civil War remained a highly personal war in Missouri and Kansas. It was not considered to have been only about the big issues of slavery and state's rights, but about the issues of defending one's home and property in the presence of neighbors who had killed someone close. Hostilities on the Kansas-Missouri border dating from before the "official" start of the war in April 1861 were still being felt.

Bates County residents felt Kansas, since they had come out on the winning side, had been given unlimited license in controlling how the story would and should be told. They felt Missouri had not been allowed to tell their side and they had come to believe their side was neither wanted or welcome. They felt that their history had been denied, their cultural property had been appropriated, and that they had little or no say in how these were used. It became clear that, in addition to my responsibility as a researcher and an archaeologist, I would be expected to be a responsible steward of their history and

their cultural property and to acknowledge and guarantee that their voices could contribute to how it was used.

## Archaeology and Cultural Property

According to the Convention for the Protection of Cultural Property in the Event of Armed Conflict with Regulations for the Execution of the Convention 1954 (No author, 2012), Cultural Property is defined as follows (emphasis added):

> "The term 'cultural property' shall cover, irrespective of origin or ownership:
> (a) movable or immovable property of great importance to the cultural heritage of every people, such as monuments of architecture, art or history, whether religious or secular; ***archaeological sites***; groups of buildings which, as a whole, are of historical or artistic interest; works of art; manuscripts, ***books and other objects of artistic, historical or archaeological interest***; as well as scientific collections and important collections of books or archives or of reproductions of the property defined above;
> (b) buildings whose main and effective purpose is to preserve or exhibit the movable cultural property defined in sub-paragraph (a) such as museums, large libraries and depositories of archives, and refuges intended to shelter, in the event of armed conflict, the movable cultural property defined in sub-paragraph (a);
> (c) centers containing a large amount of cultural property as defined in sub-paragraphs (a) and (b), to be known as 'centers containing monuments'."

While this definition was initially established for use in times of armed conflict, it set the stage for later debate about cultural property in general and its ownership and use to negotiate cultural identities. Native American and other indigenous groups have made

ownership of their cultural property a key point of debate in seeking to control their own cultural identities. Recent laws such as NAGPRA have established the validity of cultural property rights and their importance within communities. The subject of cultural property is no less important within the realm of historical archaeology (Shackel, 2000 & 2001; Singleton & Orser, 2003; Goody, 2006; Dawdy, 2008; Orser, 2010). Recent publications on the topic have included examinations of cultural property and cultural heritage rights extending from Iraq (Brodie, 2006) to Benjamin Franklin (Jeppson, 2006).

Cultural property rights are seen to be of such current significance, not only within the discipline of anthropology, that international organizations have been established to promote and preserve them. The International Centre for the Study of the Preservation and Restoration of Cultural Property (ICCROM) in Rome is one such organization. In October of 2005, ICCROM conducted a forum entitled "Cultural Heritage in Postwar Recovery" (Stanley-Price, 2007). In the abstract to his paper "The Thread of Continuity: Cultural Heritage in Post-War Recovery," Stanley-Price (2007) notes:

> "Cultural heritage must be recognized as a crucial element of the recovery process immediately following the end of an armed conflict, and not be considered a luxury to await attention later. It is argued that re-establishing the thread of continuity in people's daily lives is a priority goal. The restoration of nationally symbolic monuments or the recovery of looted collections is only one element in the revival of cultural identity; instead, the significance to people of their home and its lands – and a popular desire immediately to revive traditional practices – are well documented and must be incorporated in primary recovery strategies."

This was written with current post-war communities in mind, including modern polities and organizations. However, it is directly related to the cultural milieu in Bates County and its continued struggled with issues of cultural property and cultural identity.

While anthropology in general and archaeology specifically have sought to come to terms with issues of cultural property in a variety of contexts, the question of cultural property within the context of the Missouri-Kansas Border War remains unexplored. The archaeology of slavery notwithstanding, the question of cultural property at the household level within the context of the entire Civil War has received relatively little attention. Most nationally or locally recognized Civil War sites are related to battlefields, or locations related to a specific battle or individual, and not for their contribution to our understanding of the day to day lives of citizens during the war.

Understanding the conflicted histories that surround the Missouri-Kansas Border War and the unsuccessful attempts or inability by the involved groups to negotiate a full range of acceptable cultural identities is challenging. There are a variety of avenues of research that can be undertaken in order to gain a better understanding of these issues. One avenue of research is historical, making use of the variety of written records available about the time period in question, as well as subsequent years. Another avenue of research is ethnographic. This would be a significant undertaking on its own, and would, of course, require a planned research design, including Institutional Review Board approval for use of human subjects during the course of the study. A third avenue of research, which is the topic of this dissertation, is archaeological. Written records from an historical period or ethnographic analysis and observations can provide significant insight into what happened in the past, and how it is perceived in the present. Archaeology can bring to light previously unknown lines of evidence that are a direct reflection of day to day behavior, unedited by those who created the record. Archaeology can make significant contributions to these historical and ethnographic efforts and help existing

communities deal with this conflicted past by placing special emphasis on the value of material culture—historic sites and artifacts as well as the documents associated with them—in these negotiations.

## The Missouri-Kansas Border War as a Case Study

For many years, significant archaeological work has been conducted on Maya sites, with Arthur Demarest's work at Petexbatun (2006) being a prime example. It seems widely accepted that Mayan archaeology is applicable not only to Mayan sites or cultural processes, but can be used as a case study for looking at issues such as social collapse and warfare in other geographical regions and time periods. Jared Diamond uses the example of Maya warfare and collapse prominently in his book, *Collapse: How Societies Choose to Fail or Succeed* (2005). Indeed, one would run the risk of being labeled provincial or at the very least, overly particularistic, to assert that Mayan archaeology is only useful in a narrow geographical and chronological sense. The same can be said about the study of warfare and violence in the American Southwest. Stephen LeBlanc's (1999) work on warfare in the region, and Christy and Jacqueline Turner's (1998) examination of cannibalism and violence are noted examples, and are often cited by those examining warfare and violence in a larger sense.

As Arthur Demarest shows in his work at Petexbatun, an ongoing pattern of warfare in the Maya region can be linked to an overall destabilization of the culture, and ensuing collapse and abandonment of major sites. Additionally, he pointed out that an understanding of a region's unique culture history is of critical importance in determining the extent to which warfare had a long-term impact on the area (2006). These are themes

which can be revisited in Bates County, when examining the extent to which years of pervasive warfare had an impact on the residents, not only during the war and immediately after, but even up until the present day. The history of the county is unique within the context of the Civil War, as will be discussed in depth in Chapter 2, and an understanding of the critical events during that time period are necessary to determine the extent to which warfare was a prominent factor.

The current expansion of conflict archaeology to look beyond so-called "battlefield archaeology" and seek a broader understanding of the causes and consequences of warfare and other forms of violence is a welcome development. The archaeology of the Maya and of the American Southwest has been, and should be, seen as a useful tool in evaluating cultural processes related to conflict. These localized instances of conflict have long been used to increase our understanding of larger cultural processes, across both time and space. Do only exotic and/or prehistoric sites have anything to contribute to the discussion? Indeed, modern studies of post-war communities have shown that long-term guerrilla warfare can have a negative impact on cultural continuity and cohesion. An excellent example of this is a collection of papers titled "Cultural Heritage in Postwar Recovery (Stanley-Price, 2006), stemming from a conference to discuss the ways in which loss of cultural heritage can lead to cultural disintegration in war-torn areas. This modern example demonstrates a greater need to understand the ways in which guerrilla warfare can lead to the sort of cultural collapse seen not only in the Maya and the American Southwest, but on the Missouri/Kansas Border as well. Why not, then, also examine 19$^{th}$ century conflict in Missouri as a viable case study?

When looking at conflict, there are multiple phases to consider: the before, during and after, if you will. The main goal of much of the archaeological work done to date at historic sites has been to identify evidence of, or reasons for, violence. Much of the focus has been on the "before" and the "during," with not much focus on the "after." While these are extremely important considerations that are necessary for understanding the full picture of violence throughout history, it is also important to use archaeology to add to our understanding of patterns of behavior with respect to socioeconomic responses to violence and warfare. While direct violence is certainly deadly, the long-term economic impacts can be extraordinarily devastating for the affected societal groups.

What are the long-term socioeconomic impacts of conflict? Historic sites have much to offer in that we can often know, without question, that conflict took place. With prehistoric sites, it is not immediately evident or possible to know what violence took place, when, or why. With many historic sites, however, there is no need to guess what the archaeological record is telling us in that respect. Archaeology in Bates County, Missouri is a perfect example of this. The Border War of 1854-1865 is a well-documented phenomenon historically, although not archaeologically, in which guerrilla warfare was a fact of life for the residents of western Missouri and eastern Kansas. Studying these sites in Missouri can help us to recognize patterns of response to conflict. If warfare among the Maya and in the American Southwest is not just an example of localized events with little to tell us about broader cultural process, one should ask again… why not Missouri?

### *Theoretical Underpinnings*

War is indeed an old aspect of human history, but archaeology is looking at it in new ways (Arkush and Allen, 2006; Creamer, 2001; Geier Jr. & Winter, 1994; Haas, 1990, 2001; Keeley, 1996). More specifically, over the past decade, archaeological research has shown that pervasive violence and warfare can have a direct effect on social, cultural and economic systems in pre- and non-state societies (Keeley, 1996; Ember & Ember, 1997; LeBlanc, 1999). Stimulated by key archaeological research focusing on "primitive" warfare in the southwest (LeBlanc, 1999) as well as other areas throughout the world (Ferguson, 1997; Keeley, 1997; Martin, 1997; Maschner, 1997), North American archaeologists have made the causes and indicators of violence a growing area of research (Keeley, 1996; LeBlanc, 1999; Gilchrist, 2003). Much of this work has focused on evidence for prehistoric violence, such as ethnographic evidence (Ember & Ember, 1997), skeletal evidence (Ferguson, 1997; Martin, 1997), settlement patterning (Keeley, 1996; LeBlanc, 1999), and evidence for weapons, defensive architecture and burning of structures (Keeley, 1996, 1997; Maschner, 1997; LeBlanc, 1999).

The lack of archaeological research on the long-term impact of this violence, particularly in historic sites, has meant that it remains poorly understood. An increasing number of studies at historic-period sites have focused on the circumstances surrounding specific events of violence, including those at Mountain Meadows, Sand Creek, and the Tulsa Race Riot (Fisher, 2003), the Ludlow Coalfield Massacre (McGuire, 2004; Saitta, 2009, 2004, 2002), Mine Creek (Lees, 1991), and Black Kettle's Village (Lees, 1999). These studies, however, focus for the most part on the evidence for violence and/or the short-term impact on those directly involved.

Additionally, archaeology benefits fom examining data from sites that span the spectrum of human history without what some see as a preconceived notion that historic-period sites have nothing to tell us about human behavior in the past (Scott & McFeaters, 2011). Some recent archaeological examinations of subsistence patterns as related to chronic violence have shown promise in developing theories of socioeconomic responses to violence (Maschner, 1997; LeBlanc, 1999), and it is certain that additional archaeological studies in this area will add to the multiple lines of evidence already being studied to give us a broader understanding of warfare, violence, and its archaeological correlates (Ferguson, 1997; Gilchrist, 2003).

With that in mind, archaeological research was conducted on sites in Bates County, Missouri, an area affected by devastating violence during the mid-19$^{th}$ century. The Missouri-Kansas Border War of 1854 to 1865 was like no other in American history (Monaghan, 1984; Fellman, 1989; Goodrich, 1995; Gilmore, 2006). No other American conflict has involved so many elements of "total war," in which the clashing social, economic and racial sentiments of a young nation erupted into merciless partisan fighting, and where efforts to destroy the basic war-making capabilities of whole communities and regions obliterated meaningful distinctions between civilians and military combatants (Joes, 1996). Even the enormous destruction of clashing Union and Confederate armies east of the Mississippi River did not rival the fratricidal bitterness and sheer societal destructiveness of the Border War (Atkeson, 1918; Fellman, 1989; Goodrich, 1995; Gilmore, 2006).

Perhaps the most devastating event that occurred during the Border War period was Brigadier General Thomas Ewing's issuance of General Order No. 11, which

demanded the depopulation of the entire Border District, a four-county area along the western border of Missouri (Figure 1.1). All inhabitants of the border region not living


*Figure 1.1: Counties Included in General Order No. 11*

within one mile of a Union encampment were required to vacate their property within 15 days. While the other counties in the Border District had a few exempted areas where people were allowed to stay, Bates County alone was entirely depopulated. As a follow-up to the exodus, Union troops burned almost every structure in the county as a way to further deny guerrillas aid and comfort (Atkeson, 1918; Goodrich, 1995; Neely, 2000, 2007; Gilmore, 2006). This environment in Bates County lends itself as an ideal context for evaluating theories of the socioeconomic effects of warfare.

This study of conflict in 19th century Missouri uses archaeology to strengthen a broader predictive framework about types of warfare and socioeconomic change, and the often undocumented devastation brought about by the economic deprivation that can be caused by such chronic violence. Steven LeBlanc defines "chronic" warfare as warfare which happens almost on an annual basis, so that there is seldom a generation which does not experience warfare (1999). The Border War conflict in Missouri and Kansas fits this description in that it was at least an annual event, but typically happening more than once in a given year.

While this warfare took place within the context of a state society, its form and execution could be compared to the warfare more commonly seen in non-state societies. While most state societies have historically only engaged in warfare once in a generation (Keeley, 1996), 65% of non-state societies have been documented as being at war continuously (Keeley, 1996). Additionally, while state societies typically engage in formal, organized battles, non-state societies typically engage in a variety of tactics, including total war, ambushes and raids, and massacres (Keeley, 1996). The situation along the border of Missouri and Kansas, culminating in total destruction through General Order No. 11 was reminiscent of this type of warfare. All of these characteristics provide a unique opportunity to study the responses and consequences of this type of warfare within a historically documented state-level context.

War creates pressures where economic deprivation is a weapon. Violence, or even the threat of violence, can have an impact on day-to-day and economic activity, as well as settlement patterning (Joes, 1996; LeBlanc, 1999). Provisioning strategies, trade patterns, levels of consumption, and access to goods are all potentially affected by living in an

environment where conflict is a constant reality, and these are things that can be detected by examining the archaeological record. Bates County provides a relatively intact archaeological record of rural life extending from the early- to mid-19th century, a period of pervasive and chronic warfare, through the overall period of agricultural boom and eventual rural decline seen in the majority of the rural United States in the early 20th century. This allows a robust comparison of socioeconomic patterns in the material record, in a way that has not yet been done. Due to the widespread devastation and overall destruction of infrastructure in the county as a result of the Border War and General Order No. 11, it is hypothesized that the socioeconomic base changed and contracted to such an extent that it never recovered after the war to the same extent as other areas. The pressures of a decade of chronic warfare can be seen in the archaeological record, in the way that household economies and trade networks restructure themselves in response to conflict.

For many decades, the civilian victims of warfare and its consequences have been relatively invisible in archaeology. Certainly, historical and ethnographic data can be useful in identifying when and where violent events have taken place, but it is also well understood that there are limits to historical and ethnographic data (Wobst, 1978; Jurney, Moir & Westbury, 1987; Lightfoot, et al, 1998). As stated earlier, archaeologists have begun to re-evaluate the study of warfare (LeBlanc, 1999; Gilchrist, 2003; Demarest, 2006), and the emerging field of conflict archaeology (Scott and McFeaters, 2011). Archaeological work in Bates County, Missouri can significantly contribute to that re-evaluation, emphasizing the importance of identifying not only battlefields, but the effects of warfare that cross-cut time and cultural geography. This school of thought

argues that warfare has significant, identifiable effects on culture change; indeed, this approach hypothesizes that war frequently is an important cause of culture change, whether on a prehistoric or historic time level.

A key approach to understanding the cross-cultural correlates of warfare, and one which is very useful in looking at the impact of warfare in Bates County, is the work by Keeley (1996) in his ground-braking volume, *War Before Civilization*. Keeley seeks to dismiss the idea that fundamental differences exist between so-called "primitive" (smaller group size, without formal or standing armies) and "modern" war, emphasizing instead a commonality of warfare strategies and effects of war across societies at many levels of socioeconomic complexity.

Among the latter, it is particularly important that Keeley identifies warfare as a potent source of culture change in the behavior of the base population of societies at war, whether hunter-gatherers or states. For example, chronic war or even the credible threat of violence often causes the contraction of trade networks, disruption of provisioning systems, reorganization of communities for defensive purposes, allocation of productive resources to acquisition of weapons and war materiel and reorganization of household economies under conditions of imposed scarcity. Indeed, in these studies, changes in morbidity and economy at the household level under threat of war are linked to declining health, altered settlement patterns and collapse of existing socio-political hierarchies.

What about historic societies? Can the effects of warfare in inducing significant culture change at the household and community level be detected in comparatively recent Euro-American societies? Of course, the historical record can be informative about such things, but the extent to which they can illuminate culture change is variable. Written

records can be limited in scope, could have been destroyed or lost over a period of time, and could significantly under-represent specific groups of individuals (slaves, women, children, the uneducated, those in rural areas, etc.). The material record, in these cases, can become an excellent tool to answer these questions. In Bates County, this material record has been largely overlooked, and in many instances disregarded by local residents as uninformative compared to what they see as "valid" historical documents. On the contrary, this material record is extremely important in that it provides a window into the entire landscape of existence in Bates County, regardless of what may have been captured in the written record. This is the essence of historical archaeology: the ability to examine a line of evidence that is at once independent of, and complementary to, the existing written documents.

The 19th century Border War on the Missouri-Kansas frontier should be seen as a valuable case study in this regard. By assessing the impact on the socioeconomic status of those caught up in this environment of pervasive warfare, it can enable regional and temporal comparisons of the effects of various types of violence across not only North America, but other regions as well. It can also contribute to the broader theoretical debates about the effects of chronic violence on peoples from all cultures, societies and time periods, including areas that are currently affected by systemic violence and warfare. In situating the study of 19th century guerrilla warfare on the Missouri/Kansas border in the context of the socioeconomic impacts of chronic violence and conflict, this project can help to forge links between archaeology and other key disciplines – such as cultural anthropology, history, economics and sociology – that are currently investigating not only the past, but the present impacts of pervasive violence and warfare. It is an attempt

to use archaeology to strengthen a broader predictive framework about types of warfare and socioeconomic change, and the often undocumented devastation brought about by the economic deprivation that can be caused by periods of chronic violence.

### *Studying Warfare as Culture Change in Bates County, Missouri*

The primary goal of this research is to understand and define a baseline pattern of socioeconomic response to chronic warfare on the 19th century Missouri/Kansas border, which can then be used to create an interpretive and predictive model for these sites and others in the area. Little prior work has been done to date on the impact of chronic warfare on civilian populations within the context of the American Civil War, so it is necessary to create an initial pattern against which future work may be compared. This will enable a more broadly based interpretation in the future. This goal will be accomplished by identifying available indicators of trade and consumption during the time of the Border Wars (1850s – 1860s), and when possible, during the later period of Reconstruction (1870s-1880s) and the Golden Age of Agriculture (1890s-1920s). The type and overall frequency of ceramics and glassware, access to healthcare as shown by the presence or absence medicine bottles, the style and number of firearms and tools, will be compared to known data about the cost and availability of such consumer goods.

Archaeological research was conducted on sites in Bates County, Missouri, an area at the epicenter of some of the worst guerrilla warfare on American soil. Even the enormous destruction of clashing Union and Confederate armies east of the Mississippi River did not rival the fratricidal bitterness and sheer societal destructiveness of the Border War (Atkeson, 1918; Fellman, 1989; Goodrich, 1995; Gilmore, 2006). The

history of the border region tells a story of reconciliation and reconstruction; of how former enemies were able to restore a society that flowered into a golden age of rural American culture (Neely, 2000). This environment in Bates County creates an ideal context for evaluating theories of the socioeconomic effects of warfare.

To begin modeling socioeconomic responses to non-state violence, there are two main research questions which will be engaged. The first question concerns chronology, and whether it is possible to fine-tune temporal control in order to reliably associate materials with the period in question (approximately 1855-1865), and the period of reconstruction that came after (primarily post 1870). This comparison is critical in differentiating between socioeconomic responses related to periods of violence versus those related to a later time of relative peace and order. The second question concerns the ability to establish reliable indicators of economic status by looking primarily at issues of resource availability and consumption.

**Research Issue: Chronology** – To understand how warfare had an impact on socioeconomic functioning, it is critical to be able to reliably associate the material culture from a site with the appropriate time period. In sites such as this, where the shift is taking place within a decade or perhaps two, it is particularly critical. The nature of the conflict along the Missouri/Kansas border has created a circumstance where it is highly likely that this can be accomplished. This conflict has been historically documented as occurring within a specific and narrow timeframe, and the destruction of these sites has also been documented (Atkeson, 1918; Neely, 2000).

Two sites have been identified in the area of Amsterdam, Missouri: the Straub Site (23BT1128), and the Limpus Site (23B1129). During the time of their initial

occupation, they were located within a mile of West Point, Missouri, which was only in existence from 1850 – 1861 (Unknown, 1883; Atkeson, 1918). During its existence, it was one of the largest cities in Bates County, and boasted several hotels, a grocery, three daily mail deliveries, newspapers, mills, and a variety of other businesses (Unknown, 1883; Atkeson, 1918). In 1861, Jim Lane and a band of Union soldiers burned West Point to the ground, and after the enactment of General Order No. 11 in 1863, the town never recovered (Atkeson, 1918; Neely, 2000). It wasn't until 1891, when the town of Amsterdam was incorporated, that another town was built in the general area (Atkeson, 1918; Neely, 2000).

The use of overlapping data sets has proved successful in determining the chronology of historic sites, even within a very narrow window (Lewis, 1977; South, 1977; Jurney, 1987d; Moir, 1987d;). The sites in question contain types of artifacts which have shown to be fruitful in this endeavor. In particular, the chronometric patterning of window glass has shown that it can be used to date sites down to a decadal scale (Moir, 1987b; Schoen, 1990). In addition, this is a time period when the use of cut nails versus wire nails helps to define site chronologies, in spite of their somewhat idiosyncratic nature (Carlisle & Gunn, 1977; Jurney, 1987a; Adams, 2002). Additionally, the type and style of ceramics can be used to narrow down the chronology of sites (Price, 1979; Miller, 1980; Lebo, 1987a; Moir, 1987a; Miller, 1991). Another key indicator of chronology for these sites is firearms parts. The period from 1855-1865 saw a critical shift in firearms technology, moving from single shot cap & ball weapons to repeating firearms with percussion caps (Hicks, 1940, 1961; Horn, 1962; Gluckman, 1965; Hoyem, 1981; Hogg, 1985). As these changes directly overlap the primary time period in question

at these sites, firearms parts can be an important tool in refining the chronology of the artifact assemblages. Taking these artifact types into account (window glass, ceramics, nails and firearms parts), overlapping datasets can then be used to develop mean date ranges for each assemblage and site (South, 1977). Cross-correlating this data with existing historical accounts, tax records and plat maps for each site increases the level of certainty in those chronologies by using different and multiple lines of evidence.

**Research Issue: Economic Status** – Another critical research question is concerned with the ability to discern economic status, in particular by identifying patterns that illustrate potential periods of restriction in consumption and/or trade, and whether those patterns can be associated with chronic warfare versus the overall constriction of resources found in frontier areas. Previous archaeological research on prehistoric sites have correlated periods of violence with restrictions on foraging/consumption/trade (Keeley, 1997; Martin, 1997; LeBlanc, 1999), but little has been done to date on historic sites, looking at the same question, although some work has been done looking at patterns of material culture on the frontier (Lewis, 1977). This research will be significant in that it begins to fill in that gap.

By looking at how far various consumer goods have traveled to reach their final destination, the quantities in which they were consumed, the types of goods being purchased and/or traded for, and the amount of use/repair, it is possible to begin piecing together a picture of how freely items were moving in and out of the area during the time of the Border Wars, compared to the time of Reconstruction that came after. It is important to note that railroads did not become a significant presence in Bates County until almost 1880 (Atkeson, 1918), so a meaningful comparison of available goods versus

actually consumed goods in the county, both during and immediately after the war, is possible, not complicated by the introduction of mass transport facilitated by railroads. The Limpus Site has been documented as a grocery store in the 1840s and possibly 1850s, and then as a farmstead in the Border War period and after. As the Straub Site is a farmstead, this provides another unique opportunity to directly compare what was available at a store in Bates County, and what was being consumed on a farmstead. While no local newspapers are known to have survived the destruction of General Order No. 11, historical documents such as catalogs will help to provide information about availability and cost of items, as well as government records concerning 19th century industry and manufactures (i.e., Unknown, 1971). Previous work looking at economic practices in the Little Dixie area of Missouri (Bremer, 2006) will provide additional means for comparison.

Overlapping data sets would also be used to identify economic trends in artifact assemblages. Firearms parts can be an important indicator of economic status and allocation of available resources. As mentioned previously, this period of time (1855-1865) is a critical period of change in firearms technologies. The newer, and more efficient, firearms were more expensive, but historical data suggests that the guerrillas carried multiple repeating weapons during their raids (Mink, 1970; Fellman, 1989; Gilmore, 2006). It is possible that an arms race of sorts could have been initiated in the Missouri-Kansas border area, necessitating a switch to the newer, more expensive weapon types. Indicators of these newer repeating weapons in archaeological sites would include minie balls, evidence of rifling, the form and design of powder flasks, the presence (or absence) of percussion caps, .36 or .44 caliber bullets, and the lead needed to

make these bullets (Hicks, 1940, 1961; Horn, 1962; Gluckman, 1965; Hoyem, 1981; Hogg, 1985). Identifying the presence of these items, and their quantity, can be an important indicator of the need for individuals and families to focus more or less of their resources on these materials versus day-to-day household items, or on standard, less expensive firearms.

Ceramics will also provide another key dataset to indicate the value of items being consumed, and the distance from which these items were transported. Patterns of consumption of local utilitarian wares versus more exotic and/or decorative wares will be an important indicator. Previous studies focusing on local and rural ceramic traditions (Price, 1979; Lebo, 1987a; Moir, 1987a), as well as studies concerned with ceramics as indicators of status difference economic status (Otto, 1975, 1977; South, 1978a; Miller, 1980, 1991; Manson and Snyder, 1996), will be used to identify socioeconomic patterns related to ceramics. Additional datasets, including medicine and other bottles (Wilson, 1981; United States Department of the Interior-Bureau of Land Management, 2008), farm tools and implements (Gerlach, 1986), faunal remains related to diet (Jurney, 1987b), window glass (Moir, 1987b), and low-frequency personal, household and farm items (Lebo, 1987b, 1987c) will be analyzed and used to identify patterns of resource restriction or expansion. While patterns of resource constriction may be expected in a frontier time period, it will be important to identify whether these patterns are still present in later periods when Bates County is no longer considered a frontier area.

Two hypotheses about economic response to and recovery from primitive warfare on the border and General Order No. 11 are therefore proposed:

*Hypothesis 1) A pattern of* ***economic response to chronic warfare*** *on the Kansas-Missouri border can be defined and differentiated from economic patterns during the later period (post Civil War) of recovery and reconstruction.* Using artifact seriation and overlapping datasets, a fine-tuned chronology can be determined at short-term occupation sites like those at the border, allowing occupation layers to be isolated and compared. The pressures of a decade of primitive warfare can be seen in the archaeological record, in that household economies and trade networks will restructure themselves in response to chronic violence.

*Hypothesis 2) The archaeological record to provide a* ***depth and type of data that cannot be found in the existing historical record***. Much of the historical data of the time was destroyed as a result of General Order No. 11, leaving archaeology to fill in much of the missing information. Additionally, even when records do exist, the day-to-day activities of rural farmsteads are typically not documented in either governmental or personal records.

The data sets described above will be critical in answering my research questions. Overlapping data sets consisting of items such as flat window glass, nails, ceramics, bottle glass, gun parts and faunal remains will help to address *Hypothesis 1* and household-level responses to primitive style violence. Following the success of other historic site studies in being able to create fine-tuned chronologies (Jurney, 1987a; Moir, 1987b; Schoen, 1990) and using the archaeological assemblages to identify socioeconomic patterns (Otto, 1975, 1977; Moir, 1987d; Resnick, 1988), combined with data from emerging studies on the archaeology of violence and warfare in prehistoric sites (i.e., LeBlanc, 1999), this analysis will speak to the importance of looking at

socioeconomic responses to violence through time. Previous historical research done on economic status and patterns in Missouri (Bremer, 2006) will provide additional information for comparison and correlation with the archaeological record.

While county tax records and plat books will help to provide some detail about taxable items, settlement patterns, and potential building locations, the artifact analysis from the two sites will address *Hypothesis 2* in providing a level of detail about socioeconomic conditions at the individual household level that is typically not found in standard historical documents. The only available tax book in Bates County, in the period leading up to and during the war, is from the year 1863. The majority of records, including all known newspapers, were destroyed during the course of General Order No. 11. Personal letters, diaries and other first-person accounts of the events in Bates County during this time are scarce, and the ones that do exist do not provide much detail related to consumption of goods or trade. While these sites were formed during the historic period, and documents are available to provide context and verify site locations, substantial information about the people who lived during this troubled time and its aftermath remains in the ground.

The Federal Government recently named forty-one counties in Missouri and Kansas as a National Heritage Area. This area, called the Freedom's Frontier National Heritage Area, was so established because of the events that took place during the Border Wars on the Missouri/Kansas border. Bates County is centrally located within this area, and was deeply affected by the events that took place. Part of the purpose of a National Heritage Area is to draw attention to its importance, and to encourage a wide variety of research and scholarship that will provide new information about the events and the

people affected by them. The current occupants of Bates County, along with the staff of the Bates County Historical Society, are deeply connected to their history, and interested in new ways to promote and maintain that history. My project employs archaeological, historical and economic data to better understand the impact of this prolonged period of violence at the household and societal level, not only during the Civil War, and immediately after, but extending into the 20th century and the consciousness of the 21st century descendant communities.

This project will contribute directly to research on chronic violence and warfare, and its archaeological correlates. Assessing the impact on the socioeconomic status of those engaged in and affected by this environment of pervasive warfare will enable regional and temporal comparisons of the effects of various types of violence across North America and other regions as well. It will also contribute to broader theoretical debates about the effects of so-called "primitive" style violence on peoples from all cultures, societies and time periods, including areas currently being affected by systemic violence and warfare. Situating the study of 19th century guerrilla warfare on the Missouri/Kansas border in the context of the socioeconomic impacts of this style of violence will help to forge links between archaeology and other key disciplines that are currently investigating not only the past, but the present impacts of pervasive violence and warfare. This study will also help make contributions to the development and refinement of methods used to exert chronological control over sites formed over relatively short time spans (on the scale of one decade), and to a better understanding of the archaeological correlates of violence and warfare.

This project sets the stage for more interdisciplinary cooperation between historians and anthropologists. Additionally, it encourages more cooperation between "historic" and "prehistoric" archaeology by recognizing the potential for comparison of evidence across time periods. As mentioned earlier, studies of prehistoric warfare pose similar questions for historic studies, such as the extent to which warfare contributed to cultural collapse and discontinuity. Also, the study of historic periods of warfare can provide behavior patterns reflected in the material culture that would inform prehistoric archaeologists about previously undetected signs of warfare. By thinking not only in terms of "time periods," but in terms of larger questions of human response to warfare, both historic and prehistoric archaeologists can have access to an even larger and more valuable store of data. It will also show that identifying patterns of socioeconomic response to violence and warfare can lead to greater understanding of past culture change and assist with current anthropological and political dialogues about the impact of violence on current cultures.

Members of the community in Bates County, as well as the Bates County Historical Society, have expressed interest in the outcome of this study. One need only tour the town square in Butler, Missouri to view the General Order No. 11 and Battle of Island Mound murals in order to understand that these events are still very much a living memory in the area. As a descendant community, the residents of Bates County have a demonstrated interest in what they can learn about their ancestor's experiences. This research will provide an additional source of information for these descendants, one that comes from the material record, and which will have a long-lasting impact on their memory of these events. The results of this research will be disseminated through the

Bates County History Museum (owned by the Bates County Historical Society), as well as to schools and other local organizations through public presentations, museum displays, and information posted on the museum website. In conjunction with being part of the Freedoms Frontier National Heritage Area, this research will help to publicize the importance of the history of the region.

In addition, this project will help draw attention to the importance of a rapidly vanishing and underappreciated archaeological resource – the 19th century farmstead. While many such sites are believed to be in Bates County because of limited development in the area, many early farmsteads have been destroyed by development, and others are endangered. It is important to help communities understand what they can learn about their own history, and to demonstrate the importance of historic sites within the overall context of archaeology.

### *Summary of Chapters*

Chapter II, "Unleashing the Wolf: Violence on the Border and its Aftermath," sets this work within its historical context. A brief discussion of the relationship between archaeology and history is followed by an account of the pertinent historical periods in Bates County. This summary of Bates County's history discusses not only the Border War era, but the post-war settlement and the county's "golden age" and decline. The implications for archaeology are then discussed, followed by specific historical information for each of the two sites.

Chapter III, "Methodology," discusses not only the research methodology undertaken for this work, but the appropriate field methodology and analytical methods

employed. While a there is a brief discussion of the available methods for historical archaeology, the focus is on the methods employed in this research project.

Chapter IV, "Excavations," details the field work that was conducted beginning in October of 2007, and continuing through June of 2009. This includes detailed information about the initial site survey of the area, followed by a description of the work that was done at both 23BT1128 (the Straub site) and 23BT1129 (the Limpus site).

Chapter V, "Data Analysis," will focus on answering the two main hypotheses outlined in Chapter I. Namely, it will engage the issues of chronology, and socioeconomic change. An in-depth analysis of the appropriate artifact types for each question is provided, specifically: window glass, nails, ceramics, gun parts and domestic glass (chronology); and ceramics, medicine, luxury goods and faunal remains (socioeconomics).

Chapter VI, "Summary and Conclusions," synthesizes the data presented in this dissertation, with a primary focus of answering the two main hypotheses. First, the issue of temporal control is discussed, with a specific emphasis on the considerations at historic sites such as these. Then, a preliminary model for warfare as an agent of culture change is presented as a template for future research. The direction and aims of related future research is then also proposed, and the long-term impact of public archaeology in Bates County is discussed.

## Chapter II
## Unleashing the Wolf: Violence on the Border and its Aftermath

*"Any country which takes itself seriously ought to know about its own past."*
Jens Jacob Asmussen Worsaae, quoted in Stine Wiell, 1996, A letter from Line: the Flensburg antiquities and the Danish-Prussian/Austrian war of 1864. *Antiquity* 70:270.

### *The Relationship of Archaeology and History*

Historical events influence choices and behaviors of those who live through them. These choices and behaviors, in turn, have an influence on the material culture that is then deposited. Furthermore, these choices and behaviors may very well differ from the information that people choose to record about themselves or others. Historical archaeology can be used on multiple levels to learn new information about past events and peoples. It can be used to reveal history that has long been hidden from the written record; it can correct inaccuracies in the historical record (such as the work done at the Battle of Little Big Horn site (Scott et al, 2000)); and it can also re-examine history from new perspectives, asking new questions. Archaeologists working with historic sites, then, are challenged to sift through the rich data of history and focus on the information that can be of use in forming and answering anthropological questions. Archaeologists must look at history with the eye of an archaeologist; that is, to look at what has been recorded and read through the lines to see the potential impacts on broader patterns of human behavior and their archaeological correlates.

The role that historical archaeology plays has long been a subject of debate since the discipline was articulated as an independent endeavor beginning in the 1960s and 1970s. The debate that began with Clyde Dollar and Stanley South in 1967 (Dollar, 1968; South, 1968) has continued in various forms up to the present day. In this debate, Clyde Dollar articulated the idea that historical archaeology is not anthropological in the same

way as prehistoric archaeology, since prehistoric archaeologists deal with "people" in a more general sense, and historical archaeologists deal with a "person" or "persons." Because of this, Dollar proposes that historical archaeology should be approached "historically and deductively," (Dollar, 1968).

Stanley South, however, argued that an overly historical particularist approach to analyzing historic sites was too narrow of an approach, and denied the wide range of data that could be obtained by archaeology, regardless of the time period in question (South, 1968). He states:

> "As archaeologists, it seems me that we are concerned with the identification and interpretation of data ***reflecting patterned human behavior*** (emphasis added). As historical archaeologists, we utilize historical data, and in so doing we can often deal with the unique events of history as well as the generalized cultural patterns. We should not, however, discard all the tools designed for obtaining generalized data merely because some of these may not apply when dealing with specific historic sites; nor should we fail to utilize the wealth of specific historical data that is available to correlate with archaeological discoveries. We should, rather, utilize any approach that will allow us to add to our knowledge in the most effective manner; through the many faceted discipline of historical archaeology," (South, 1968: 52).

This historical overview of Bates County, then, is written with this goal in mind. The main function will be to outline the events that shaped Bates County from the slavery issue involved in Missouri statehood through the county's eventual decline in population and production in the early 20th century. Throughout this span of time, the residents of Bates County saw the challenges of a frontier, years of guerrilla warfare, organized battles of the Civil War, the utter destruction of General Order No. 11, the subsequent rebirth of the county and a boom in population, farm production and mercantilism, the coming of the railroads, a mining boom and bust, and a mirroring of the early 20th century rural exodus seen through much of the country.

While the bulk of this history will focus on the Border Wars and the events leading up to General Order No. 11, it is also important to understand what came before and how the county fared after a time of such upheaval. When asking anthropological questions about responses to and recovery from such events, it is important to understand the "before" and "after" pictures as well. For an overall timeline and a map with significant events, please see Appendix E.

## *Setting the Stage*

### The Louisiana Purchase and Territorial Government

The Louisiana Purchase of 1803 contained within it all of the land that would later become the state of Missouri (with the exception of the land included in the Platte Purchase of 1836). Even though statehood was still eighteen years away, it was not long before the question of slavery raised its head and began to create problems in the region (Foley, 1999). When establishing the new government for the Louisiana Territory, the US government divided it into two territories: the Territory of Orleans, and the District of Louisiana. The Territory of Orleans was made up of the area south of the thirty-third parallel. The future state of Missouri, then, fell into the newly formed District of Louisiana (Foley, 1999).

The Territory of Orleans fell under the auspices of a region where the allowance of slavery was not in question. The Louisiana Territory fell under the direction of the Indiana Territory, where slavery was prohibited by its Northwest Ordinance. Additionally, slavery was simply not mentioned in the act of Congress that created the

government for the Louisiana Territory. This made slave owners in the Louisiana Territory understandably nervous (Foley, 1999).

With the eventual passage of the bill in 1805 to establish the territorial government, a pattern of avoidance of the slavery question in Missouri had begun, and would continue – with dire consequences – for several decades. Indeed, in his book, "A History of Missouri: Volume I, 1673-1820," William E. Foley states, "…under the leadership of the new governor, James Wilkinson, the territory entered a period of factionalism and bitterness seldom seen even in unstable frontier communities," (1999, p. 96). Even after Wilkinson's departure as governor, the area would remain a place of turmoil, and the situation was not much improved by recurring financial uncertainties and the onset of the War of 1812 (Foley, 1999).

## Missouri Statehood

Following the War of 1812, the Missouri territory entered a period of growth and economic stability that helped to propel it toward eventual statehood (Foley, 1999). Settlers came flowing into the territory, increasing the population from 25,000 in 1814 to more than 65,000 in 1820 (Foley, 1999). Due to a lack of restrictions on slavery, people from the upper South made up a large number of the new settlers. Kentucky made the largest contribution to Missouri's new residents was (Gerlach, 1986), but settlers from places such as Virginia, Tennessee and North Carolina also joined the ranks (Gerlach,1986; Hurt, 1992; Foley, 1999; Neely, 2000; Mutti-Burke, 2004).

In addition to general increases in population, the slave population in Missouri increased sharply as well, increasing from about 3,000 slaves in 1810 to about 10,000 in

1820 (Foley, 1999). Indeed, the scarcity of labor in the territory, coupled with increased demand for building due to land speculation, created more and more reliance on black workers (both free and slave) (Foley, 1999).

While initial settlement in the Missouri territory focused primarily along the Mississippi on the eastern region, as increasing numbers of settlers began to arrive with westward expansion the territorial government became more stable (Foley, 1999). Of particular note, settlement began along the area that later became known as "Little Dixie," with the establishment of the "Boon's Lick" country, the area in central Missouri along the Missouri River, and expansion into the counties of Boone, Howard and Cooper, just to name a few (Hurt, 1992; Neely, 2000).

The rapidly rising population, increased concerns over the ability of the territorial government to control such a large area effectively, and the desire of the residents of the Missouri Territory to have a voice in their own affairs all contributed to the growing demand for statehood. The territorial legislature finally made a formal request for statehood in November of 1818, which was submitted to Congress in December of the same year (McCandless, 2000). The path to statehood would not be easy, as the question of slavery in the new state would become a touchstone issue with national implications.

At the time of Missouri's request for statehood, there was a balance in the country with regard to slave and free states, with eleven of each (McCandless, 2000). Whether Missouri was admitted as a slave or a free state would upset that balance, and it was a matter of significant interest for both sides of the issue how Missouri would be admitted to the Union. Anti-slavery interests were already trying to press their advantage of more highly-populated states in order to gain more power for their interests and to prohibit any

new slave states from being admitted. It became increasingly important, therefore, for the Southern states to assert their authority and protect their interests by advocating for any new state(s) that would be friendly to the institution of slavery.

It is no surprise, therefore, that the petition for Missouri's statehood became a pawn for these two competing interests. When the House of Representatives passed the statehood enabling bill for Missouri, an amendment had been added by Representative James Tallmadge of New York. This amendment restricted further expansion of slavery in the new state and dictated the "gradual emancipation of future slave children," (McCandless, 2000: 3). This amendment was, of course, unacceptable to Senators from slaveholding states and was therefore rejected in the Senate on February 27, 1819 (McCandless, 2000). Missouri was still a territory.

In the meantime, the territory of Maine had requested admission to the Union as a free state, and Massachusetts had consented to this division as long as statehood for Maine could be granted by March 4, 1820. It became increasingly difficult to support Maine's admission and yet oppose Missouri's. The slavery question, was still a volatile one as the territory of Arkansas had recently been created without restrictions on slavery. Anti-slavery proponents would not easily let go and have Missouri admitted to the Union as a slave state (McCandless, 2000).

A flurry of votes and amendments took place, with each side jockeying for position and superiority while still trying to expedite the admission into statehood of both Maine and Missouri. The final solution became known as the Missouri Compromise, and was passed on March 3, 1820. In short, it "…admitted Missouri as a slave state, Maine as a free state, and prohibited slavery in the Louisiana Purchase north of 36° 30', except in

Missouri," (McCandless, 2000: 5). Missouri was finally admitted as a state in August of 1821.

While this compromise may have solved the question of Missouri statehood, it did not solve the question of slavery. In a letter to John Holmes, dated April 22, 1820, Thomas Jefferson summed up the state of affairs very eloquently, stating:

> "…this momentous question, like a fire bell in the night, awakened and filled me with terror. I considered it at once as the knell of the Union. It is hushed, indeed, for the moment. But this is a reprieve only, not a final sentence. A geographical line, coinciding with a marked principle, moral and political, once conceived and held up to the angry passions of men, will never be obliterated; and every new irritation will mark it deeper and deeper… as it is, we have the wolf by the ear, and we can neither hold him, nor safely let him go… I regret that I am now to die in the belief that the useless sacrifice of themselves, by the generation of (17)76 to acquire self government and happiness to their country, is to be thrown away by the unwise and unworthy passions of their sons, and that my only consolation is to be that I live not to weep over it." (Library of Congress, 1820).

While this reprieve would tenuously last another thirty-four years, Thomas Jefferson was absolutely correct in stating that this "wolf" would prove to be a terrible thing when finally, and inevitably, released.

### Kansas/Nebraska Act

Increasing interest from Missourians wishing to settle the land to the west, and the overall pull of Manifest Destiny and the discovery of gold and the need for viable overland trails for trade, helped to create the momentum for establishing the Kansas and Nebraska territories (McCandless, 2000; Neely, 2000; SenGupta, 2001). The question of opening these territories created new opportunities to debate the question of slavery. It was within the interests of southern legislators to decry the limitations of the Missouri Compromise and to advocate that the new territories should be allowed to have slavery if

they so chose. On the other hand, anti-slavery interests were invested in making Kansas a free state (Monaghan, 1984; Neely, 2000; Gilmore, 2006; Neely, 2007).

The Kansas-Nebraska Act created two territories, with Kansas defined as existing between latitude 37° to 40°, and Nebraska existing between latitude 40° to 49° (Etcheson, 2004). In addition, the Kansas-Nebraska Act was based upon principles of "popular sovereignty," which called for the question of slavery in each territory to be determined by special elections. Additionally, this Act had the unique feature of exempting territorial legislation from congressional approval. This gave the territory of Kansas the power to act without the typical oversight from Washington, D.C. (Neely, 2000; 2007).

While this did not directly repeal the Missouri Compromise of 1820, it effectively made it null and void and re-opened the old wounds that were only temporarily healed thirty-four years prior. Citizens of Missouri who advocated for slavery assumed that they would be the primary people who would settle the state and felt confident that they would make it a slave state. For this reason, it was not a matter of concern that Nebraska was to be dominated by free-state advocates from Iowa (Neely, 2000). Kansas, then, was poised to be the focus in the fight to come. Abolitionist groups on the East Coast saw this as a prime opportunity to sponsor groups to settle in Kansas and thwart the plans of Missourians and other advocates of slavery. In the meantime, many Missourians had already squatted on land in Kansas before its opening as a new territory. Free-state advocates who came in to settle cried foul that they should have to compete as independent producers against those who had the advantage of slave labor. Almost immediately, bitter divisions were drawn and an ongoing series of rigged elections, rival

legislatures and bloody violence dominated the years from 1854 up until and through the Civil War (Neely, 2000; 2004; 2007; Etcheson, 2004; Gilmore, 2006).

### *Violence on the Border – Bates County, Missouri*

#### Early White Settlement

Prior to white settlement in the area that was to become Bates County, the occupants were Osage Indians (Gerlach, 1986). When Missouri became a state in 1821, its Western border moved to include what was once Osage Indian territory and moved the "permanent" Indian country to the area west of the Missouri state border (what would later become the Kansas territory) (Neely, 2000). Missionaries were soon sent to the Osage territory to convert the Indians and the Harmony Mission was established; it remained active until about 1835 (Neely, 2000; 2004). In addition, the American Fur Company, owned by St. Louis founder Auguste Choteau, sent fur traders to work in the area (Neely, 2000).

This initial influx of white settlers was relatively modest and continued to be so for many years, even after the county's incorporation in 1841 (Gerlach, 1986; Neely, 2000). At this time, travel via local waterways was still the most efficient way to move goods and people. The area that would become Bates County did not have much in the way of available waterways in order to facilitate travel into its interior (Neely, 2000). The Osage River did flow from the Missouri River (near Jefferson City) and into southern Bates County. It was not a very robust river as one neared Bates County, and it was only during years of "exceptional flooding" (Neely, 2000) such as in 1844, that steamboats could make it up even as far as Papinville, in southern Bates County. Overall, overland

transport was still the primary method, and it had an impact on settlement rates until the coming of the railroads after the Civil War (Neely, 2000).

As mentioned earlier, Bates County was initially organized in 1841, but its borders were adjusted in February of 1855 to include what was once the southern part of Cass County. Additionally, that same month and year, a section of the southern part of Bates County (two miles wide and thirty miles long) was sectioned off to become part of the new Vernon County (no author, 1883; Atkeson, 1918; no author, 2006). Thus, the borders of Bates County were settled in time for the new troubles to come with the establishment of the Kansas territory (see Figure 1.1).

While Missouri was a slave state, there were not many slave owners in Bates County. This was due, in part, to the nature of the agriculture in the area (corn and hog production primarily) (Neely, 2000). As of 1850, there were 3,669 people living in the county, and only 40 households who owned slaves. The overwhelming majority of these households owned fewer than five slaves, and many owned just one; only two households owned more than ten slaves (Neely, 2000). This dynamic was fairly unchanged thirteen years later. According to the 1863 Bates County tax book, there were again very few slave owners in the county and only two families could be found who owned more than ten slaves. The average number of slaves owned by any given family was still around two or three (Bates County History Museum).

While settlement in the area was somewhat slow in the beginning, the overall surge of westward settlement in the 1840's, the California gold rush, and the later opening of the Kansas and Nebraska territories all served to bring settlers to the area in larger and larger numbers (Neely, 2000; 2004). The population in 1860 was almost

double that of 1850, coming in at 7,215 people (Neely, 2000). The people coming into the area were still primarily from the Upper South and practiced a mixed agriculture of corn and hog production, and were not generally large plantation owners and producers (Neely, 2000; 2004).

The peak in antebellum activity in the county can be illustrated by looking at the township of West Point and in particular at the town of West Point itself. The town was located along the western border of the county, right across from the Kansas territory. It is one of the highest points in the county, at 1000 feet above sea level, and was initially settled starting in 1850. It had the advantage of being one of the last outposts on the trail from Westport Landing for those going into the Kansas territory, and was also on the Texas cattle trail (no author, 1883; Atkeson, 1918).

At its height, West Point boasted around 700 people, and was well known as a bustling and prosperous town. There was a post office, which was for a while the western most terminus of mail routes coming in from Harrisonville, Kansas City, Clinton and Butler (no author, 1883). The town also had a drug store, dry goods store, a mill, a school, and a printing press that printed the weekly West Point Banner. There was also a forty-room hotel along with three other smaller hotels. The total count of businesses in the town was sixteen (no author, 1883). This pattern of growth and prosperity was soon to come to an end as the violence along the border began in earnest soon after the opening of the Kansas territory.

## Violence Along the Border, 1854-1863

Tensions were running high and violence broke out almost as soon as the Kansas territory opened in 1854. Rival groups of settlers began arriving in 1854 near present-day Lawrence and began jockeying for power (Gilmore, 2006). To make matters more complicated, rival legislatures were soon established: one supporting a slave-free Kansas and the other one supporting its entry into the Union as a slave state. The "free-soilers" soon took to disobeying what they saw as illegally created territorial law and many skirmishes broke out in the area. As an example of this activity, an armed group of abolitionists overtook an individual by the name of Sheriff Samuel Jones and released another individual by the name of Jacob Branson, who had been arrested for threatening to kill Franklin Coleman (Gilmore, 2006).

The violence was not only happening in and around the Lawrence area. In May of 1856, in reaction to the sacking of Lawrence earlier that month, John Brown murdered five proslavery settlers in the Pottawatomie Massacre (Gilmore, 2006). This action occurred in Franklin County, Kansas, only two counties west of the border with Missouri. In addition, during this time armed bands of "border ruffians" from Missouri took advantage of the lack of oversight with respect to land claims, and harassed any new settlers with suspected antislavery sentiments, which included theft and arson among other crimes. They protected their own claims in the Kansas territory that they sought to maintain in order to tip the population balance in favor of slavery (Neely, 2004). Free soil promoters were also guilty of such acts, and became known for making forays into Missouri, "jayhawking" people's property and destroying homes and lives as well (Atkeson, 1918; Neely, 2004; Gilmore, 2006).

The residents of Bates County were mostly pro-South and created a refuge for the border ruffians. The result of this was to make Bates County a center of border violence and activity for the period leading up to and during the Civil War (Monaghan, 1984; Neely, 2000). It was during this time of guerilla warfare, prior to the official outbreak of the Civil War that many figures rose to prominence and infamy. Among these were John Brown, Jim Lane, Charles "Doc" Jennison, William Clarke Quantrill, and "Bloody" Bill Anderson, just to name a few (Monaghan, 1986; Leslie, 1998; Neely, 2000; 2004; 2007; Petersen, 2003; Gilmore, 2006).

Being near the middle of the border region, and as it was south of the Missouri River and border crossings were more easily managed, Bates County became a hotbed of border violence and activity. Even after the war began, the guerrilla activity did not cease, and residents of the county were plagued with not only terrorist-style warfare from marauding bands of Bushwhackers or Jayhawkers, but they also had to endure the hardship of proximity to larger organized battles of the Civil War, such as the Battle of Wilson's Creek and the Battle of Lexington (Bartels, 1992; Goodrich, 1995; Neely, 2007). The boundary line between soldier and guerrilla blurred, and general confusion and terror was the overall state of things in the entire border district (Fellman, 1989). As W.O. Atkeson states in his 1918 *History of Bates County Missouri*:

> "It became the rendezvous and hiding place of bushwhackers, marauders and irresponsible, lawless gangs who perpetrated all manner of outrages upon peaceable citizens and their property. Gangs, largely of the same general character, from Kansas, invaded this county either in retaliation or merely to plunder our citizens. The feeling was intense on both sides – the result of about six years of struggle over the Kansas free state questions. Conditions were such that these bushwhackers and lawless bands could neither be controlled nor punished by the armies in the field…"

While the population of the county had doubled from 1850 to 1860, it is hard to really quantify how many people had actually settled the county in those intervening years but subsequently left prior to 1860 because of all the border violence. A rough count of casualties by 1858 stands at around 200, and the destruction of property in the border region has been estimated at close to two million dollars (Neely, 2000). It is certain that many residents who had lived in the border region during this time chose to leave, as it was one of the few safe options available. It is difficult to say how many of these people chose to relocate to a different part of the county, and how many chose to leave the county altogether. Understandably, immigration into the area also suffered during this time (Neely, 2000).

The example of the town of West Point serves once again to demonstrate the level of destruction and terror that was being experienced, particularly along the western edge of Bates County. Jim Lane, along with Union troops, came into the town in 1861 and burned it almost entirely to the ground. Although a post office and a few residences were maintained for a while after this event, West Point eventually disappeared entirely. Today, one can hardly determine where it used to exist (Atkeson, 1918).

## General Orders Nos. 10 and 11

The fate of West Point was soon to become the fate of all Bates County. The level of guerrilla warfare did not let up after the start of the Civil War, and the Union Army had to expend a great deal of time, energy and resources in trying to control the situation along the border. By the spring of 1863, it became clear that the situation was only becoming worse, and the Union had to take drastic measures to put the area back under

control. The guerrillas saw themselves as a necessary component in the War, with the goal of protecting their families and property that were under threat by the occupying Union troops. They considered themselves to be on a par with "regular" soldiers, and wanted to be treated as such. The Union Army, however, saw them as local hostile forces, unaffiliated with any formal army, and thereby not deserving of the same provisions or due process of "regular" soldiers (Goodrich, 1995). Because of their local focus, the guerrillas were aided in significant ways by family members and friends of the family. They helped to provide these guerrillas with food, shelter, weapons and ammunition, as well as cover when Union patrols came calling.

Union officers determined that relocating the families and other suspected or known supporters of guerrillas, or bushwhackers as they came to be known on the Missouri side, would help to deprive them of the infrastructure they needed to successfully conduct their ongoing raids. To this end, Brigadier General Thomas Ewing issued General Order No. 10, aimed at identifying and detaining anyone aiding and abetting guerillas, on August 18, 1863 (Castel, 2006). This order called for military escorts to remove "loyal free persons" out of Missouri and into Kansas, or to permanent military stations in Missouri. In addition, it called for the arrest of men, and all women who were not heads of families, who were known to be actively engaged in aiding guerrillas. These individuals were to be sent to the District Provost Marshall for punishment. Wives and children of known guerrillas, and other female heads of guerrilla families, were to be notified that they had to leave the state of Missouri. If they did not leave, they were to be removed South, under military escort. One of the effects of this order was that family members – mainly women, because it was mostly women and

children who remained behind in the Border District at this time – of many known bushwhackers were rounded up and held in a jail in Kansas City. This jail collapsed for unknown reasons, injuring and killing several of the women (Goodrich, 1995). One sister of William "Bloody Bill" Anderson died and another was left permanently disabled.

Quantrill and his men were outraged by the enactment of this order and the harm done to their female relatives. Three days later, on August 21, 1863, Quantrill and his men perpetrated their famous raid on Lawrence, killing almost 200 men and destroying the town (Leslie, 1998; Petersen, 2003; Castel, 2006). This event created a national outcry against the situation on the border, and General Ewing was prompted to act. His response was to issue General Order No. 11 four days later, on August 25, 1863.

The order required that all residents of the Border District, which included Jackson, Cass, Bates, and a northern section of Vernon Counties, be removed from their homes. Some residents were allowed to stay if they lived within a mile of a current Union encampment, such as Kansas City, Hickman's Mill, Independence, Pleasant Hill and Harrisonville. Citizens residing in other parts of the Border District could establish temporary lodging within military posts if they could pass a loyalty test. All others had to leave the district by September 9$^{th}$ or be either imprisoned or shot on sight (Neely, 2000).

The Union Army was empowered to seize whatever property they could use for their purposes (crops, livestock, etc.) and primarily burned or destroyed all other property (Monaghan, 1984; Goodrich, 1995; Neely, 2000). The two weeks allotted for complete depopulation of the Border District did not allow the residents time to take much of value with them when they left. Indeed, many soldiers did not pay attention to the September

9th deadline and residents of the District often had to leave much sooner (Goodrich, 1995; Neely, 2000).

Letters from the time tell of the terror, confusion and mayhem that accompanied the enactment of the order. A Ms. Emily Steele wrote a letter from Lexington, Missouri, to her son, on September 20th, 1863. In it she describes her family as "scattered to the four winds" and as financially devastated due to the small amount of personal items and livestock they were able to take with them when they had to leave their home (Eakin, 1996). Other letters from the time period tell the same story of confusion, death, loss of property and utter terror.

Bates County was particularly hard hit by General Order No. 11, as it was the only county entirely depopulated. Residents in Jackson and Cass counties had the "safe" areas of Kansas City, Independence, Hickman's Mill, Pleasant Hill and Harrisonville, so those counties were not entirely depopulated. Vernon County was not entirely included in the order, as only the northern half was included in the Border District (Neely, 2000). Therefore, Bates County alone was forced to entirely depopulate. After the citizens left, what remained of their homes and property was almost entirely destroyed by either Union troops or bands of Jayhawkers (Neely, 2000; 2004; 2007).

The destruction was absolute, and the area for years afterward became known as the "Burnt District," (Neely, 2000). Atkeson, again, in his 1918 book *History of Bates County Missouri,* sums it up perfectly:

> Bates County became a tenantless wilderness. Fires raged unchecked throughout the prairie, woods and overgrown fields. The territory became the haunt of wolves, dogs and an occasional outlaw seeking refuge. The history of the county until the close of the war, remains a blank…There were no court sessions, no real estate transfers, no records, no taxes assessed or collected. As far as records or legal proceedings were

> concerned, Bates County ceased to exist from September of 1863 to the close of the war. At the war's end, three badly dilapidated schoolhouses and some homes were left standing along the eastern border - these and occasional "Jennison's monuments" were the only signs of past habitation in a large portion of the county… Those who returned to Bates County found they had no courthouse, no office buildings and no money. Much of the land, never reclaimed by the original owners, returned to the government and was sold for taxes.

## The End of the Civil War

From the enactment of General Order No. 11 to the end of the Civil War, most activity in Bates County came to a halt. While concerned groups of citizens attempted to maintain a sense of order and even elected county officials in absentia, those appointments were hardly long-lasting as many of the men were forced to leave the area for various reasons (Neely, 2000).

It is interesting to note that the most complete devastation and destruction in the county seemed to have happened along the western border area, adjacent to Kansas. This would make sense, as it would be easier for groups to come into that section of the county from Kansas, conduct their raids, and retreat back across the border. Additionally, those former residents who had property in the eastern part of the county could more easily monitor their property from adjacent Henry County or other nearby areas, whereas this was much more difficult for those whose property was in the western portion of the county (Neely, 2000). Furthermore, because of the need for overland travel, it would have been more difficult for those in the western portion of the county to take much of their property with them. This, too, would have increased the losses for those living in the western portion of the county (Neely, 2000).

While residents were eventually given the opportunity to come back into the county and reclaim their homes when General Brown took over command of the district in 1864 (Neely, 2004), the continued instability in the area, combined with an overall mistrust of the Union Army due to General Order No. 11, helped to keep most residents out until after the end of the war (Neely, 2000).

### *Post Civil War settlement, 1865-1880*

#### **Rebuilding and Reconciliation**

Repopulation of Bates County did not really begin in earnest until 1866 (Neely, 2000). The rates of return were not overwhelming, and varied depending upon which side of the county is being discussed. For instance, it is estimated that between 1865 and 1870, only 39% of the county's pre-war population returned (Neely, 2000). Furthermore, the rate of return in the eastern portion of the county was much higher, ranging from 41% to 78%; return rates in the western portion of the county only ranged between 16% and 30% (Neely, 2000). While the initial return rates were slow, the pace picked up to the point where Bates County's 1870 population (15,960) was double its 1860 population (7,215) (Neely, 2000). Indeed, when one considers that the population in 1865 was practically zero, the influx of almost 16,000 by 1870 is a significant change (Neely, 2000).

The places of origin of those coming back into the county changed. While much of the pre-war population that returned was originally from the Upper South, that portion of the country had been devastated due to the war. Therefore, residents of that area did not have the resources needed to move into Missouri, or any other region for that matter (Neely, 2000). Settlers from the North Midland (i.e. Illinois, Indiana, Ohio) came in

droves and soon became a strong presence not only in Bates County, but the entire state of Missouri (Neely, 2000). Since much of the land owned by pre-war residents was sold for back taxes, prime farmland was available at very good prices for those willing to make the move (Neely, 2000).

Significantly, the number of native Missourians living in Bates County declined in the post-war years. Native Missourians and those from the Upper South now made up less than half the county's residents (Neely, 2000; 2004). This was a significant change from the pre-war era. Additionally, there was a significant exodus of African Americans out of the county after the war. In 1860, there were 450 African Americans living in Bates County. In 1870, this number had been reduced to only 120. This trend has not been reversed and the number of African Americans as a percentage of the population in the county remains very low (Neely, 2004).

The North Midland settlers created a far better environment for reconciliation. The county's population became more diverse than prior to the war and for the most part the residents were primarily interested in rebuilding and moving forward rather than continuing patterns of violence and outward animosity (Neely, 2000; 2004; 2007). While many smaller towns such as West Point were never rebuilt, the large towns and county seats were rebuilt quickly so that county business and overall rebuilding could move forward as soon as possible (Neely, 2000; 2004).

### The Coming of the Railroads

As mentioned earlier, the main mode of transportation to and within Bates County was overland transportation. No rivers of any volume came closer than Papinville, in the

southeastern corner of the county, and then only during times of extreme flooding. Therefore, it was important to establish railroad lines for the transfer of people and goods for the rebuilding of the county.

Even before the war, residents of Bates County had looked toward the future and wanted to bring railroads to the area (Neely, 2004). The people coming back to Bates County also realized the importance of the railroads, but consensus on how to get the railroads and how to pay for them remained elusive (Atkeson, 1918; Neely, 2004). A significant number of railroad bonds were proposed throughout the 1860's and 1870's, but disorganization, corruption, and a general mistrust of government and corporate interests doomed most of them to failure or at least prolonged fighting and chaos (Atkeson, 1918; Neely, 2004).

The Missouri, Kansas and Texas railroad did finally construct a line five miles in length in 1870. It was located in Rockville township, in the southeastern portion of the county (Atkeson, 1918). It did not prove to be much of a benefit for the rest of the county. The Lexington & Southern railroad finally came through the county seats of Cass, Bates, Vernon, Barton and Jasper counties (which would include Butler, Missouri in Bates County) in 1879 (Atkeson, 1918). The discovery of bituminous coal deposits in Osage County also prompted an eastern extension of the Kansas City, Ft. Scott & Gulf railroad from Pleasanton, Kansas to Osage County.

The national Panic of 1873 helped to put a damper on railroad development (Neely, 2000). The rise of the Farmer and Merchant class in the county during this time also fostered an attitude that resisted such change unless it could be seen to benefit everyone and not just large corporations. This attitude, in essence, kept the railroad boom

from ever "booming" very much in the county (Neely, 2000). Needless to say, towns sprung up along these railroad lines (such as Adrian and Rich Hill in western Bates County), while other towns either dried up or were never rebuilt due to the absence of such lines (Atkeson, 1918; Neely, 2000; 2004).

### *Golden Age of Bates County, 1880 – 1900*

#### Farmers and Merchants

Prior to the war, farmers represented the overwhelming majority of settlers in the entire county, even in Mount Pleasant township where the county seat of Butler was located (Neely, 2000). After the war this began to shift. While the number of farmers was still high in 1870, by 1880 some specific demographic shifts were taking place. While some townships were still largely dominated by farmers, particularly in the western portion of the county, other townships began to be dominated by merchants, professionals and artisans (Neely, 2000). In particular, "…almost 90 percent of the professionals (e.g., doctors, lawyers, teachers, clergy), merchants, artisans, and service workers that were recorded in the 1880 sample lived in Mount Pleasant township, settling particularly around Butler," (Neely, 2000:73).

While the division between farmer and merchant class was growing, and causing a certain level of tension and mistrust, the population of Bates County was also growing. By 1880, the population had grown from 15,960 (in 1870) to 25,381. By 1890, the population had peaked at 32,223. Although it declined somewhat by 1900, the population at that point was still significant, at 30,141 (Neely, 2000).

**The Coal Boom**

A significant part of Bates County's population increase in the late 19th century was due in no small part to the coal boom. Many of the postwar boosters saw the coal producing potential in the area near Rich Hill (Osage township) as a tool for bringing in railroads as well as economic stimulus for the whole county. The trend was to bring in non-local businessmen and investors rather than rely on local residents and funds. This did change the coal mining in the area from a subsistence activity to large-scale industrial mining, but it also removed the control from local hands to corporate entities that sometimes did not even reside in the state (Neely, 2000).

The growing population in Bates County created a demand for coal for heating purposes. Originally, the mining in the area had been done by small, family-owned mines. That changed after 1879 when corporate interests discovered the coal mining potential of Rich Hill. The discovery of this mining potential brought railroads to the Rich Hill area by 1880. The coal boom had begun (Neely, 2000). While the county's population had been growing steadily since the war, a large portion of that was due to the mining activity in Rich Hill. The county's population in 1890 was 32,223; a large portion of this population increase was centered in Rich Hill, which saw its population grow from 500 to almost 5,000 in 1890 (Neely, 2000).

This boom in mining not only had an impact on Rich Hill but on nearby towns as well. The establishment of railroad lines in the area allowed for creation of towns such as Adrian, Hume and Passaic. Additionally, commerce thrived in the area, including, "…four large flour mills, a foundry, a cigar factory, and the Southwestern Lead Zinc Smelter, which processed the minerals shipped north from the mines near Joplin,"

(Neely, 2000:89). It seemed that the postwar boosters in the county had been correct., There were significant resources available to support Bates County well into the future.

***The Decline of Bates County – post 1900***

The coal boom was not to last. Many factors played a part, including rising costs of labor, the problem of worker strikes and conflicts with management, and financial instability of the mining corporations themselves. The primary factor was simply the exhaustible nature of the coal - the output of the county's mines fell 53% in 1894 (Neely, 2000). By 1912, the Rich Hill Mining company gave up its mining operation in Bates County. The other mining company in the area, Keith and Perry Corporation, ceased mining operations by 1905 (Neely, 2000).

Bates County started to see decreases in population after 1890, with a loss of over eight thousand people (about 25%) by 1920, when the population stood at 23,933. A large portion of this population loss was due to the mining bust in Osage township, particularly in the town of Rich Hill (Neely, 2000). The only census year when the postwar population was lower was in 1870.

Another reason for the overall population decline was the general exodus out of rural areas and into cities in the early 20$^{th}$ century. Although population decreased sharply from the late 19$^{th}$ century to the early 20$^{th}$ century, farm productivity continued to increase due to improvements in agricultural practices. For instance, a 320-acre farm in 1880 could produce around 1800 bushels of corn. A similar sized farm in 1912 could produce around 7700 bushels of corn (Bureau of Labor Statistics, 1914). So while the population has continued to decline, the increased rates of productivity have allowed

Bates County to continue to its agricultural production. At the same time, other development in the area has been sparse, limiting the impact on those ruined homes and buildings in the county.

### *Implications for Archaeology*

The rich and varied history of Bates County provides a great deal of good information for archaeologists interested in historic sites. There are several key elements to consider when attempting to formulate anthropological questions.

The first is demographics. When attempting to interpret and understand the material remains of individuals who may or may not be individually defined in historical documents, it is very useful to know from where the people who settled Missouri came. The items brought in and used by families from the Upper South, for instance, may differ in significant ways from those brought in by people from the North Midland states, or from Europe. Once in Bates County, the various groups may have turned to using similar items. Since the period of interest here is relatively brief (a few decades), it is quite possible that both groups brought goods with them from their place of origin, and patterns in those goods might be visible.

The second is transportation and access to goods. The fact that overland travel had been the primary mode of transportation for those coming into the area before the war, as well as for at least a decade or two after the war, is significant. This provided a reference point for how long goods had to travel to get to Bates County, the relative ease (or not) of access to those goods, and their subsequent value. Taking note of specific steamboat and railroad routes is important, as it indicates where items might originated. All of these

considerations help to determine the relative value of material culture within a given context.

A third is any significant extraordinary events in the area that could cause the inhabitants to react in specific ways that could have an impact on their material culture. The violence along the border, the battles of the Civil War, and the utter destruction of General Order No. 11 would all have had a significant impact on the individuals living through those events. One could predict a shortage of items, depending upon which trade and transportation routes would be cut off in certain circumstances. Prolonged use and significant repair of items could also be predicted. Additionally, the destruction caused by General Order No. 11 would create an environment where many homes would have been destroyed and not reclaimed, thereby creating potential time capsules for the area.

Finally, the subsequent brief population boom in the county would help to put into context any additional occupation layers that may appear along with those dating to the time of General Order No. 11. Understanding when people came back, and in what areas, would help to predict how many different occupation layers might exist. Additionally, the subsequent decline in the population of the county, along with an overall lack of intensive development in the area, indicates more potential for sites to remain relatively intact for future study.

### *Historical Background of Sites*

Unfortunately, the massive destruction that resulted from General Order No. 11 claimed many written records from Bates County that would have been highly useful in providing detailed information about the residents at both sites in this study. There are a

few surviving records that provide useful details about the sites, including who lived there and how the sites may have been used. These include some remaining plat maps, tax records and surveyor's notes from the period. Unfortunately, newspapers from Bates County for this period were all destroyed during the war and no known copies from the Border War period exist. I was not able to find references to the sites included in this research project in newspapers from neighboring areas, such as Kansas City.

As a note of clarification, the sites are named after current landowners who were generous enough to allow excavation on their land for weeks at a time, and not for previous residents. The known historical information about the sites is detailed below.

**The Straub Site (23BT1128)**

The earliest available plat maps of the West Point Township in Bates County, Missouri indicate that John Green owned the land where the Straub Site is located in 1856. His holdings consisted of the west half and the northwest quarter of Section 17, Township 41, Range 33.

John Green was born in Lowell, Massachusetts and came to Missouri by the early 1830's. He was college educated and was unique in that he owned both cattle and horses, which were scarce in Bates County at the time, and owned a a grist mill. John married Jane Delaney of Ohio and they had their first child, a son named Theodore, in 1831. Their second child was a son named Commodore, whose birthdate is unknown. Sarah, their daughter and third child, was born in 1850. Theodore survived the war and went on to marry the daughter of a farmer from Linn County, Kansas (just across the border from Bates County). This reportedly caused a rift with his father that never healed.

Commodore was assumed to have been killed during the war (Glassmire & Thornton, 1991). While there is no record of John Green having owned slaves, the account of his anger over Theodore's marriage of a girl from Kansas raises questions about whether John's loyalties were with the Union or the Confederates. Based on Federal Census records, it is known that John and Jane had three more children: Lucy, born in 1854, John, born in 1856, and Artemisia, born in 1860.

According to local accounts, the Green family hid along the Marais de Cygnes River, where John eventually fell ill and died, during the time of General Order No. 11. He is reported to have been buried in Fontana, Kansas. It is said that Jane Green and her surviving children returned to their homestead after the war (Glassmire & Thornton, 1991), although Jane Green is listed in the 1870 United States Federal Census as living in Boone Township of Bates County, Missouri. In 1874 Jane Green made a claim (the individual against whom the claim was filed is not listed in currently available documents) in the amount of $1700 for the use and occupation of her husband's saw and grist mill, as well as repairs for damage. The same year, she also made a claim in the amount of $12,500 for replacement of fencing, piles of lumber, and bushels of coal and corn (personal communication with Peggy Buhr, Bates County History Museum). By the 1880 United States Federal Census, Jane Green was back in West Point Township.

It is unclear where Sarah Green resided immediately following the war. She is listed twice in the 1870 United States Federal Census: On June 4, 1870, she is listed as a "House Servant" in the home of Fried and Elizabeth Jarboe in Kansas City Ward 3, Jackson County, Missouri; on August 21, 1870, she is listed as residing in the household of her mother, Jane Green, in Boone Township of Bates County, Missouri. It is possible

that between June 4 and August 21 she may have left her position in the Jarboe household to return to her mother. Alternatively, she may have been there temporarily on a visit.

According to Missouri State Marriage Records, Sarah Green married Robert Kyle (also of Bates County, Missouri and thirteen years her senior) on April 22, 1872. The 1880 United States Federal Census Records indicate that they had three children: Harry (born in 1873), Lilly (born in 1875) and Larkin (born in 1879). Glassmire and Thornton indicate in their historical account of West Point (1991) that the Kyle family moved to Oregon around 1876 when Robert's health began to fail. This is supported as well by the 1880 United States Federal Census, which indicates that Sarah and Robert's first two children were born in Missouri, but their youngest child (Larkin) was born in Oregon in 1879. Glassmire and Thornton's account (1991) indicates that Robert died while they were in Oregon. However, the 1880 United States Federal Census shows that Sarah, Robert, and their three children were back in West Point Township, Bates County, Missouri at that time. Robert's headstone in the West Point cemetery shows that he died in 1883. Plat maps from the period show Sarah Kyle is listed as the owner of the area where the Straub Site has been identified (personal communication, Peggy Buhr, Bates County History Museum). It seems likely that, after Sarah's marriage to Robert, the couple resided at what is now the Straub Site except for an unknown number of years (between 1875 and 1880) when they lived in Oregon. Robert died in 1883.

In 1884, Missouri State Marriage Records show that Sarah Kyle married Elias Jarred in 1884. Neither Sarah, her husband Elias, nor her mother Jane appear in the 1890 United States Federal Census. They do reappear in the 1900 United States Federal Census. By this time, Sarah and her husband Elias have moved to the town of La Cygne

in Linn County, Kansas (just across the border from Bates County, Missouri). The 1900 census indicates that their first child, Roy, was born in 1887 in Linn County, Kansas, so we know that Sarah moved off the property sometime between 1884 and 1887. United States Federal Census records indicate that Sarah continued to live in Linn County, Kansas, until her death in 1928. She is buried in the West Point, Missouri cemetery, showing a continued connection with the area. In addition, it was related to me that a 1930 Bates County plat map still showed Sarah Jarred as the owner of the Straub Site property (personal communication, Peggy Buhr, Bates County History Museum).

By the time of the 1900 United States Federal Census, Jane Green was shown as living in West Point Township, near the current town of Amsterdam, with her daughter Lucy, her husband William Gwin, and their five children. Given that the Straub Site property remained in Sarah Green/Kyle/Jarred's name until at least 1930, it is not unlikely that the Gwin family, alone with Jane Green, was living there after Sarah and Elias moved to Kansas. Jane Green died in 1906 and is also buried in the West Point cemetery. Lucy Gwin appears in the 1930 United States Federal Census, still living in West Point Township with her fifty-four year-old daughter, whose married name was Lucy Joyce. Lucy Gwin died in 1937 and is also buried in West Point cemetery. With her death, an almost 100-year occupation of the Straub Site property by members of the Green family came to an end.

### **The Limpus Site (23BT1128)**

The Limpus Site is located in the southwest quarter of Section 17, Township 41, Range 33 in Bates County, Missouri. The Limpus Site is shown as the "C.F. Lucas

Grocery" on the original ca. 1838 surveyor's map (photographed copy provided by Larry Limpus). The extent of this grocery is not known, but a late 19th century history of Bates County indicates that there was a saloon in West Point that was also referred to as a grocery, so this could have been a similar enterprise (Atkeson, 1918). Additionally, it is known that the original military post road, connecting Fort Leavenworth and Fort Scott, came into Missouri near this area, so a saloon/grocery or other provisioning post would have been a welcome asset (Robbins, 1978).

By 1855, the original plat map of Bates County show that ownership of this land was in the hands of James J. Clark, originally of Kentucky. In 1858, James married Elizabeth Mary Lamar, originally from Tennessee, who came to Bates County with her parents William and Delilah Lamar in 1853 (Glassmire & Thornton, 1991). James J. Clark is listed as a farmer in the United States Federal Census records. Additionally, the United States Federal Census records indicate that while James could read, he could not write. These same records indicate that Elizabeth could both read and write.

Compared to the Green family, not much is known of the Clark family and their descendants. It seems that Mr. Clark and his older sons were watched during the war as known guerrilla sympathizers (personal communication, Peggy Buhr, Bates County History Museum), which could explain why their presence is lacking in the 1860 census records. James and Elizabeth Mary do appear in the 1870, 1880, 1900 and 1910 United States Federal Census, but as with the Green family, they do not appear in the 1890 records. Also, as with the Green Family, they resided in Boone Township for the 1870 Census, but were back in West Point Township for the 1880 and subsequent Census records.

The 1880 and 1900 United States Federal Census records show that James and Elizabeth had at least nine children: William (born 1859), Charles (1860), Rosa and Marian (1861), Thomas (1864), Alice (1869), Evy (1872), Althea (1879) and Arthur (1882). The 1880 Census also shows that a boarder by the name of Saul Lacy (age 26), who is listed as a cattle herder, was living with them. A man by the name of James J. Clark, who was born in 1894 and died in 1976, is buried in the West Point cemetery. It is possible that he was the youngest son of James and Elizabeth, but the 1890 census records are missing and he does not appear in the 1900 census with Elizabeth.

James Clark died in 1894 and is buried in the West Point cemetery. The 1900 Census shows that the household contained only Elizabeth, her sons Marian and Arthur, a then one-year-old granddaugther named Iva, and a nine-year-old orphan named James Fannings. The 1910 Census shows only Elizabeth and her son Arthur in the household. Elizabeth died in 1917 and she is buried in the West Point cemetery. Their son Thomas, who died in 1902, is also buried in the West Point cemetery. Arthur is shown on a 1930 United States Federal Census as a lodger in a rooming house in Kansas City, Missouri. There are no clear records to indicate that any further members of the Clark family lived on the property after 1917.

### *Conclusions*

It has long been said that history is written by the winners, and that is no less true when it comes to the history of the Missouri-Kansas Border War. The version that has emerged in popular media, and in school curricula, tends to be a fairly simplistic one. It is also the version to which I was exposed growing up in the area. In this version, residents of Kansas were ardent abolitionists, dedicated to not only the preservation of the

Union but to establishing basic civil rights for African-Americans. Missourians, on the other hand, were violent, racist Bushwhackers, seeking to maintain the institution of slavery through violence. William Clark Quantrill was one of the worst of this breed, riding into Lawrence in 1863 to kill almost 200 men and boys in cold blood. Kansas has claimed the right to the label "Free State" while in my personal experience Missouri is often depicted as a cultural backwater with lingering Confederate sympathies. One need only roam around the University of Kansas campus in Lawrence as the date nears for a Missouri/Kansas game in either football or basketball, to see these kinds of sentiments expressed on t-shirts worn on campus. A typical one states: "What is the most confusing day in Missouri? Father's Day!" In my conversations with residents of Bates County, a similar theme often came up, specifically that they felt they were viewed as secret Confederate sympathizers when, in fact, they simply wanted their side of the story to be told. Whether this is a true representation of how they are viewed by others, or simply an expression of how they feel they are viewed, it is a strong and consistent sentiment that I encounter on a regular basis.

The historical reality is not nearly as straightforward. The Battle of Island Mound is an excellent example of the complexities surrounding the Border War. It occurred in October 1862 near Butler, Missouri. This skirmish, the first engagement of African-American soldiers in the Civil War, employed members of the First Kansas Colored Volunteer Infantry who had been recruited by Jim Lane. Cherokee Indian John Six-Killer and six of his slaves also came to join the First Kansas Colored Volunteer Infantry in their fight against a group of Missouri Bushwhackers hiding out on Hog Island (Tabor, 2001). This complex combination of individuals with distinct ethnicities and social

identities fighting for a common cause is not part of the stereotypical Civil War narrative. In this narrative, the northern soldiers are the "good guys," fighting to free the slaves, and southern soldiers are the "bad guys," trying to keep slavery alive. Reactions to the movie, "Ride With the Devil," set in Missouri and told from the Confederate/Bushwhacker perspective, are a good example of how deeply embedded this narrative is in our society. In a review in Variety, by Todd McCarthy (1999), it discusses part of the difficulty of marketing a film with such a complex view of the Civil War dynamic. Mr. McCarthy states, "But what is perhaps the film's signal virtue, its refined ambiguity and refusal to see anything in simple black and white, will make this already difficult-to-market period piece even more of a challenge to sell to the public," (McCarthy, 1999). He goes on to say, "In most conventional treatments of this period, the present protagonists…" (meaning the Missouri Bushwhackers) "…would be the bad guys, redneck Confederates determined to preserve slavery and anxious to spill Yankee blood."

Other inconsistencies appear upon a closer review of history. For example, the Topeka Constitution, the first constitution adopted by the Kansas territory, barred slavery but also excluded all free African-Americans. Although a majority of the people of the territory voted in favor of it, the Topeka Convention was not authorized by either the territorial or federal government, so it was never accepted as a legal document (Potter, 1977). The perception that the residents of Kansas did vote in favor of this constitution (Potter, 1977), even though the actual vote numbers have been disputed, has never been lost on the residents of Missouri and their descendants. They consider Kansas' casual adoption of the "Free State" label (as reflected in the use of this name in various private

businesses, such as the Free State Brewing Company in Lawrence, and some public institutions, such as the Free State High School in Lawrence) as spurious.

These inconsistencies are not, by themselves, the only cause for lingering animosity and resentment between Missouri and Kansas. The image of Kansas, due to its placement on the "right" side of history, has been promoted in a positive light, arguably allowing historical institutions and individuals much control over cultural property related to the Civil War and the Border War. This has given the residents a significant amount of latitude in negotiating their own cultural identity. The "Free State" identity is a part of this negotiation in recent years, as mentioned above. In addition, the re-branding of the Jayhawk as a fictional bird, associated mainly with the University of Kansas and seen as a popular mascot, is far different from the original meaning ascribed to the term "Jayhawk" or "Jayhawker." A "Jayhawker" was an arsonist and thief – not to be trusted and capable of significant violence. Regardless of the intentions of individuals who identified as "Jayhawkers" or "Bushwhackers, to be "Jayhawked" was defined in general terms as an unpleasant experience, no more pleasant than being "Bushwhacked," (Fellman, 1989; Gilmore, 2006; Goodrich, 1995; Monaghan, 1984).

Missouri's own history further complicates its ability to negotiate its own post Civil War cultural identities. The state was filled with split loyalties, with neighbors on both sides of the conflict. It was difficult to know who was on which side of the war, and it became dangerous in some instances to let your own sympathies be known. In Bates County, where so many of the residents either chose to leave or were forced to leave by the conflict, many original residents never returned. Families from northern states moved

into territory that had been evacuated and much of the cultural continuity—and along with it consensual cultural identity--was lost.

As the ICCROM stated, it is critical that post-war communities re-establish cultural continuity and regain control of their cultural heritage, whichever iteration of that heritage they choose, in order for successful post-war rebuilding to occur. This, however, may not have happened in Missouri.,As a southern state during the war, many in western Missouri came down on the wrong side of history. In the years after the war, emphasis was placed on rebuilding, and in many instances, forgetting. Seeing the plight of the Reconstruction-era South, it is no wonder that the residents of Missouri had little desire to publicly cling to an allegiance to the Confederacy, or continuously relive the disruptions brought on by the Border War. Many families that came in to settle from areas outside Missouri (particularly those from the North) had no direct link to the Border War.

As Charles Orser stated, "Historical archaeology has always been about heritage," (2010:131). My experience in Bates County, based upon conversations with residents and public officials, has shown me that archaeology can be an important tool to help communities define and express their cultural heritage. There is a longing for a validation that they have a right to their story, as much as anyone else. The individuals in Bates County who have interacted with me in the work I am doing are primarily interested in adding to the narrative that they perceive to be out there (that of Missouri only being violent Bushwhackers who wished to continue slavery), as opposed to necessarily negating it. They have come to see archaeology as a tool that can help them to express the hardship, the terrors, and in some cases, the injustices that their ancestors or forebears

endured during the course of this conflict. Continued archaeological work in this area will only add to this trend toward empowerment. Indeed, in the years since my archaeological work started, attendance at the Bates County History Museum has increased, public awareness of the available archaeological resources has increased, and donations to the Historical Society has increased (Peggy Buhr, personal communication, 2010). Orser goes on to say:

> Research thus demonstrates how the concepts of heritage and memory are entwined with the perspectives, ideals, and worldviews of members of diverse living communities. In fact, the collaboration between archaeologists and members of descendant communities has been one of the most positive developments of the archaeological examination of heritage and memory (2010:134).

The two sites in this study, 23BT1128 and 23BT1129, are excellent examples of the arc of Bates County history, from its founding up until present day. Both sites were occupied by at least the 1850s (and even earlier in the case of 23BT1129, which was a grocery in the 1830s), providing a glimpse into the period leading up to and including the Border Wars. In addition, both sites were occupied during the Post-War Resettlement period, as well as the Golden Age of Bates County. Finally, both sites mirrored the post-1900 decline of Bates County in their eventual abandonment as home sites and their conversion to pasture land.

The proximity of these two sites to the original town of West Point, due to its strategic significance during the Border Wars period, and due to the fact that West Point was never rebuilt after the war, provided a unique opportunity to view the impact of warfare over an extended period of time. The fact that both sites were occupied long-term by the same family was an additional advantage, in that it provided a level of cultural and social continuity that allows for a more meaningful comparison through time.

As stated in Chapter 1, it is important to not only understand the larger historical patterns, but also the regional (or perhaps in this case, local) patterns. These sites, while fitting into the larger historical pattern of Bates County, provide this kind of localized understanding of the history, and its related material culture. The question of how guerrilla warfare can have an impact on cultural continuity and stability can be explored effectively with sites such as these, which provide long-term, continuous occupation. The material record, then, is able to represent change over time to help answer questions about chronology and socioeconomic condition, as related to broader historical events in the area.

# Chapter III
# Methodology

*"We ask questions of the dirt. I don't trust people. I trust the dirt. The dirt is always truthful."*
As quoted in the April 2005 obituary of Edward F. "Ned" Heite, from the *Delaware State News*

This chapter presents methodology used by historical archaeology in general and in my specific research area. I will cover three main types of methodology: research methodology, field methodology, and analytical methodology. The theoretical underpinnings of these methodologies are discussed in Chapter 2 and elsewhere and will be touched upon here for clarification. While my research on rural farmsteads in Bates County, Missouri focuses on sites directly affected by General Order No. 11, I am also interested in looking at how individuals in these rural settings lived before, during, and after this calamity. The timeframe for my research could potentially cover sites from the 1840s through the 1920s (typically the peak of rural occupation in the United States).

## *Research Methodology*

Noted folklorist Henry Glassie stated, "the past is too important to leave to historians." (1977:32). History has a place alongside archaeology. Since historical documents are inherent in the discipline of historical archaeology, we must know more about those documents. This section will discuss the types of historical records that are available and their utility for historical archaeology. A brief discussion is provided for each document type, focusing on the pros and cons of such usage, and their availability for my project. A wide variety of research organizations provide these kinds of documents and often helpful assistance in finding them (see Appendix A). Most are oral or written, and their authenticity must always be assessed. The methods for doing so may

vary according to the document type and the circumstances surrounding its collection. In general it is good for all kinds of documents to pass both an *external* and *internal* analysis (Barber, 1994). External analysis refers to verification for authenticity while internal analysis refers to verification for accuracy (Barber, 1994). (A document may be authentic but inaccurate.)

It is important to keep in mind that historical documents, by their nature, are selective about whom they represent. For example, it is common for tenant farmers and small landowners—the people upon whom my research is focused—to be "poorly represented in public documents or private records," (Jurney, Moir and Westbury, 1987:293). Archaeology, in combination with extant documents, can be invaluable for providing details that documents fail to include. It also provides information on the material record, one that is often overlooked in historical documents.

## Document Types

### Newspapers

Newspapers can be a useful and important tool in all types of historical research. They provide information not only about larger events in the immediate area and the region but also about individuals and day-to-day life that is not necessarily captured in personal diaries or history books. Newspapers also provide information about material culture, depicting or describing the types of goods and services available at a particular time, and perhaps even their costs. Real estate advertisements as well as legal transactions are often published in newspapers, providing valuable details about individual properties and estates.

Newspaper space is limited and decisions must be made as to what information will and will not be included. These decisions can be subjective and may only provide information that a small group of people, or perhaps just one individual (often the newspaper editor), deems important. It is common for information about minority groups and other underrepresented groups to be scant and biased, often severely.

One limiting factor in historical documents pertaining to Bates County is that no newspapers dating before 1868 are available at any local institution in the County (Melissa Phillips, director of the Bates County Family History Center, personal communication). A review of the available newspapers in the archives of The Missouri State Historical Society ( which can be found online at http://shs.umsystem.edu/newspapercatalog/batescounty.shtml) confirms that no newspapers prior to 1868 are available. A search of the Kansas State Historical Society archives also did not produce any newspapers from that period for Bates County. I have been unable to determine whether this is due to a lack of publication, the loss of newspapers during General Order No. 11, or a lack of newspaper preservation since that time, but it highlights a clear limitation in using newspapers: their ephemeral and perishable nature. My projected time span for sites extends from before the Civil War to about 1920 and there are numerous newspapers available for study of the period after the Civil War. The absence of earlier newspapers prevents a comparative study of different periods.

**Plat Maps**

Plat maps provide detailed spatial information in the form of records of section, township, and range as well as the name(s) of property owners. In some instances, the

general location of buildings is also provided on plat maps, and roads/trails and creek/river crossings. I have found plat maps dating to the original organization of the County in 1841 at the Family History Center in Bates County (Bates County – History of Bates County, no date). While these maps indicate who owned the property, they rarely indicate whether the owners lived on the property at a given time. Furthermore, availability of plat maps for Bates County in the 19th century is spotty and information about how the land was transferred from one owner to another is often unclear. Because of this, it is useful to correlate plat maps with documents such as tax records and grantor/grantee indices. The plat maps provide a good starting point by providing names and occasionally the location of a building on a given property. Modern plat maps provide information about current landowners and are useful to archaeologists who wish to contact them and obtain permissions for research.

**Surveyor's Notes**

Surveyors often take notes about the location of buildings on properties they are surveying. These are frequently kept on file at the County Surveyor's Office and can provide additional details about the types of structures, if any, on a particular piece of land. They may also contain details about pertinent geophysical features. General Land Office surveys (available from the United States Department of the Interior, Bureau of Land Management) also include information regarding survey plats and field notes. It is important to remember that these notes are potentially subjective and would be based upon what that individual surveyor deemed important and noteworthy. The surveyor notes for site 23BT1129 did indicate a precise location for the 1830s grocery located on

that property. While the location of farmsteads at both sites were not noted on any pre-Civil War plat maps, they were useful to a degree at site 23BT1129.

### Tax Records

County tax records can provide detailed information not only about how much a particular landowner paid in taxes, but also about what kinds of property are being taxed. These tax records also provide an accounting of the property owner's name, the Section, Township and Range of the property in question, and how many acres they owned. An 1863 tax book in the Bates County Museum in Butler provides the names of property owners as well as valuations in a number of property categories, such as livestock and slaves. It also divides property owners into "resident" and "nonresident" categories. This information is also useful for knowing about types of occupation sites and what buildings one should expect to find during an excavation. Relative wealth of a landowner can also be inferred from tax information. For the purpose of this study, County tax records (and not State or Federal) were used primarily to establish that the sites in question were, in fact, owned and used as farmsteads during the Border War period.

It is important to note that tax records (like other records such as newspapers, diaries, etc.) are entered by people and are therefore subject to human error. For example, one individual in the 1863 tax book was listed as owning property in a township and range that did not even exist. It was obvious that the number had been entered incorrectly by the clerk. So, while tax records provide good information about where to look and what to expect, one cannot assume that this is entirely accurate. It must be independently verified when possible through additional historical research, as well as archaeological excavation.

### Grantor/Grantee Indices

Grantor/grantee indices, typically found in the archives of county courthouses, can help researchers track the succession of ownership for a particular piece of land. These lists, typically kept by the County Recorder, are sorted by the seller or purchaser's last name, in chronological order. The Grantor Index lists the sellers of a particular piece of property, while the Grantee Index lists the buyers. In the Grantee index, the name of the purchaser is listed as well as the location of the property. There is usually an entry which indicates where the full deed or other similar document can be found. In situations in Bates County, where I was looking for information across several decades in a county with a tumultuous history, this was important for determining continuity of occupation. There is no reason to expect that a new landowner would continue to use the land in the same way as the previous owner. Determining continuity of ownership over a period of time is useful for interpreting archaeological sites such as these. Like any public records, the grantor/grantee indices are also prone to human error and the caprices of previous public servants who decide what to record, what to keep, and how. They reflect standards of the time with respect to property ownership by women and (by definition) exclude unofficial transactions.

### Local History Books

Books specifically dedicated to local history are apt to provide more detailed accounts than more generalized, broad types of history books. Many of these books tend to be written by people with a strong connections or interests in the area and therefore can provide a level of detail not available elsewhere. As an example of the types of books

available, I have provided a selected bibliography of books related to my research in Bates County (Appendix B).

On the downside, local historians who have strong attachments to a particular locale or piece of history may also have strong biases. A wide array of books is more likely to provide a balanced overview by providing multiple perspectives. As with any written documentation, there is a possibility for error as well as bias. Furthermore, a historian may focus on topics different from what an archaeologist would want to understand. While history books can provide a wonderful overview of a topic, as well as good details regarding dates, individuals, and events, they are always incomplete. I have found through my research on this project that local history books provide a good starting point, but can be inconsistent and sometimes provide few citations for their content. They do, however, provide specific local details which more generalized history books often omit.

**Personal Letters/ Diaries**

Personal letters and diaries, when available, can provide individual viewpoints that are often missing from other documents. Letters and diaries can come from a wide array of individuals and often relate to personal and day-to-day issues. These can be enlightening for the archaeologist as well as the historian. When available, it is useful to read them to determine as much as possible about not only the lifestyle of the writer, but about their land and how it was used and the overall political and social climate of their day.

Like other written documents, it must be understood that they are also prone to error, exaggeration and bias. Unlike books or newspaper articles, there is typically no

pretense of providing a "balanced" point of view in a personal letter or diary. While that is one of their charms and possible advantages, it is a definite disadvantage as well. It is also important to remember that one significant class of individuals is not represented in personal letters or diaries: the illiterate. In the 19th century, particularly in rural areas, it was common that many individuals could not read or write, so it is important to remember that a letter, or even collection of letters, cannot necessarily be seen to provide information that can be generalized over a larger group or population. For the most part, personal letters and diaries were mostly unavailable for not only the Border War period in Bates County, but for subsequent periods as well.

**Photographs**

Photographs can provide invaluable information about the type and number of structures in use at a particular site, as well as a glimpse at the living conditions of individuals involved. They are especially useful to archaeologists when above-ground structures have been altered or demolished. If material objects are present in a dated photograph, that can assist with the analysis of materials uncovered during archaeological excavations.

It is important to remember that photographers make choices about what to photograph and what not to photograph. Some buildings may not be visible or the perspective of a photograph may be such that a property looks more extensive or expansive than it actually was. Land features may have been modified or are no longer in existence, making it difficult to compare with current conditions. Trees in photographs can be especially helpful when they have survived, or if excavations will be undertaken in locations where they once stood. It is important to keep in mind that, if a photograph

was taken for a specific reason or special occasion, the individuals or materials represented in the photo may not represent typical activities or conditions. Unless one is aware of the specific conditions under which the photograph was taken, it is necessary to see it as a useful guide rather than a hard statement of fact. As historian Glen E. Holt points out, when speaking of the use of photography to document Chicago:

> In Chicago the physical character of a city moving from clapboard storefronts to marbled business facades is recorded, but images of the bustle of street life, the routine of the factory, and the manifestations of poverty do not exist. These inherent biases cannot be overcome except through the imaginative reading of contemporaneous verbal descriptions. Without this nonvisual corrective, early photography provides an unrealistic portrayal of the city (1982:281).

**Cemetery Records**

Cemetery records provide information about individuals buried in the area and may indicate whether any individuals are buried in proposed excavation areas. Unfortunately, cemetery records are notoriously incomplete (Melissa Phillips, Bates County Family History Center and administrator of Bates County Cemetery information, personal communication, 2007) and do not necessarily provide specific information about individuals beyond basic details of burial locations and dates. They can provide good general demographic information, such as age of death, nutrition, diseases/cause of death, race, sex, etc. (Barber, 1994). Social status can sometimes be inferred from clues provided in cemetery records or in cemeteries themselves. This includes the types of articles buried with an individual, the size, scope and expense of the grave marker and/or casket, as well as any articles that might have been deposited at the graveside after interment (Barber, 1994). Finally, the quality, style, and information on grave markers as

well as their locations relative to each other in cemeteries can provide insight into individual's roles in the larger society, their occupations, or their relationships to others. With my work in Bates County, I found cemetery records to be quite useful in filling in gaps left by Census records. Sometimes, dates of birth or death were not included in Census records, or were vague, and cemetery records would sometimes provide that information. Also, when there was a question about whether an individual remained in the Bates County area until their death, review of cemetery records could also provide such information.

### Oral Histories

As a companion to personal letters and diaries, oral histories can provide information from individuals who may not have been able to provide written accounts. This is particularly true when working with the histories of enslaved African Americans or other disenfranchised groups. Many family stories and accounts of what life was like were never written down. This was not always because the people involved could not write, but sometimes because they did not choose to take the time to value those experiences in such a way that they wanted to record them on paper. Literacy was not universal and writing paper was not always available. A large amount of useful information is available only through oral history. This includes information about ideology, group relations, uses of material artifacts, personal experience, genealogical details, etc. (Barber, 1994).

One must be able to evaluate the integrity of an oral history in order to determine whether it is useful for research. A principal consideration is how close the narrator was to the historical event or their personal relationship with story being told. If an individual

is recounting a personal experience, this tends to increase the chance that the information is at least somewhat accurate. This is generally considered a true *oral history*, even if the details are shown to be incorrect. The farther the oral story is from personal experience, the more chance there is for inaccuracy and embellishment (especially if there have not been opportunities for checking with other documents). This is often considered as *oral tradition* and is not considered to be as reliable (Barber, 1994). Oral histories were not available for my work in Bates County.

### Census records

United States Census records can provide useful information for the historical archaeologist, including general population data, numbers of literate and illiterate, those attending school within a certain age group, ethnicity or place of birth, slave population numbers, and number of acres of cropland or improved land in an area.

Recently, the publicly available census data has been organized on a website, hosted by the University of Virginia (Historical Census Browser, 2004) that makes analyzing the information faster and more efficient. It provides a robust search page that allows one to sort the data by a variety of factors easily. Websites that require paid subscriptions, such as Ancestry.com, also provide easy access to census information.

The main problem with census data in general is that it can be incomplete or inaccurate. Collection of this data and the kind of data collected has been inconsistent over the decades. For example, the number of acres of improved land on farms was only collected from 1850–1920, making comparison with earlier or later years problematic. Even so, this research tool is quite useful and is able to provide the historical information

with key information about the living standards and the general population within the United States.

Census records ended up being extremely useful in my research for this project, providing even more detail than originally anticipated. In addition to the data described above, these records proved to be helpful in determining the number of individuals living on the site at a given period, which assists with the interpretation of the quantity of archaeological material at the location.

### Probate Inventories

Probate inventories can be useful when dealing with the estate of a particular individual and in helping to determine the scope of that person's material possessions. The archaeological record consists primarily of those items that were discarded, lost, destroyed by some natural or man-made disaster, or perhaps intentionally buried. Seldom do we get to see a snapshot of the entirety of an individual's or a family's possessions in the archaeological record. That is where probate inventories, when available, can prove useful. They provide a detailed listing of an individual's household goods and possessions at the time of death, allowing a picture of a family's economic and social status (Barber, 1994; Deetz, 1996). In addition to providing details about material items owned by an individual, probate inventories can also provide information about livestock, making it possible to correlate with faunal data in order to provide yet another measure of social and economic status (Bowen, 1978).

Probate inventories do not list every single item ever owned by an individual, but only those items owned at death. Furthermore, the probate inventory typically lists only those items of value (or perceived value) at the time, items that tend not to become part of

the archaeological record (Barber, 1994). Small day-to-day items are typically excluded. It cannot be assumed that everyone would have a probate inventory done. It is still necessary for historical archaeologists to uncover material remains to get an idea of the amount and type of all materials used and discarded over time, as well as to analyze those kinds of items not typically noted in probate inventories. Archaeological data is a valuable supplement to probate inventories. In Bates County, no detailed probate inventories were available for the sites in this study.

### *Field Methodology*

In the most basic sense, "historical archaeology is text-aided archaeology, to the point that documents are a primary source for the field," (Orser and Fagan, 1995:16). The previous section focused on the various types of historical documents and records that provide the archaeologist with information about potential sites and their uses. History plays a role in taphonomy, what Michael Shiffer terms "site formation process," in that it has had a direct effect on where sites are located, how they were used, and how they became part of the archaeological record. With respect to my work in "The Burned District" in Bates County, the Civil War and events preceding and related to it were not simply a backdrop against which individuals moved. Indeed, history has been as much of an active "player" in the formation of recent sites as geology has been in the formation of ancient prehistoric sites. For this reason, it is imperative to understand the history of the area so that this history can lead one to discover sites that are not only of a particular type but that also fall within an appropriate historical timeframe. Some parts of Bates County were harder hit than others, particularly because the western portion of the county was

immediately accessible from the eastern portion of Kansas, and it is important to know the details of this history in order to determine where to focus a search for sites in areas of varying impact.

It is well understood that historical documents only contain a part of the story (Orser and Fagan, 1995; Little, 2007) and a look at available documents provides a clear picture of which parts of the story have not been told. As stated earlier, "Those who were writing documents often did not record the everyday, the taken-for-granted" (Little, 2007:60). This is especially true in the case of rural farmers, who are the focus of this investigation. In a much larger sense, the story of Bates County and the mass destruction of General Order No. 11 (Bates County – History of Bates County, no date.) makes it clear that much of what may have been written in historical documents at the time – the ever-important firsthand accounts found in local newspapers, letters, diaries, public records, etc. – likely have been destroyed. Archaeology becomes an essential tool for uncovering and confirming the details of what life was like for the individuals who lived before, during and after this event.

Because of the nature of the guerilla warfare during the Civil War, I have focused my efforts on the western border of the county. Sites there were most often attacked before and during the war (Bates County – History of Bates County, no date) and have a high likelihood of showing the evidence of such conflict and destruction. Given the rural nature of the county, it is likely that the majority of potential sites would be rural farmsteads consisting of a variety of buildings including the primary home, privy, possibly an outdoor kitchen, and a variety of other related outbuildings. Other buildings in farming communities would include dry goods stores, post offices, newspaper offices

or other commercial/industrial buildings. These would be fewer in number compared to the farmsteads. A low percentage of individuals in the county paid taxes on slaves (1863 tax book, Bates County Museum), so the number of slave quarters is likely to be low. Tax records that indicate slave owners may indicate that slave quarters are present.

Keeping all of these factors in mind, my primary goal was to locate and excavate structure foundations and the materials associated with them so as to understand the contents, residents, and uses of these buildings. All surface and subsurface excavation methods were directed at this goal. I briefly describe and discuss these below, concentrating on those methods that were most useful during the course of excavation.

## Approaches to Surface and Subsurface Research

### Surface Research

At both sites, a preliminary surface survey was conducted, to ascertain the overall quantity of artifacts. In both cases, artifacts from the 19$^{th}$ century were readily available on the surface, which therefore justified further examination (Hume, 1969b). Surface collections must not be given too much interpretive weight because they are lacking in provenience, and may not necessarily represent what is to be found beneath the surface (it could represent a later trash deposit, for instance). However, if the materials fall within the appropriate timeframe, artifact concentration on the surface can be used as a guide for where to place test pits or trenches or to use other non-invasive methods such the geophysical survey methods described below. In Bates county, the surface research proved to be rapid, effective, and justified further excavation and testing.

**Subsurface Survey – Geophysical Methods**

One primary challenge for any archaeologist is finding an efficient, cost-effective, and reliable method for detecting the location of sites with the highest potential for archaeological remains. Shovel testing is an option, but some see excavation as a "tool of last resort." (Scollar, et.al., 1990, p.1). Geophysical survey is less invasive and allows for significantly greater coverage.

Geophysical methods can be grouped into two main categories: passive and active methods. Passive techniques, which do not emit signals, include aerial and satellite photography (Wilson, 1982) as well as magnetic, thermal and gravity prospecting (Scollar, et. al., 1990). Active techniques, which are based on the emission of signals, include electrical/electromagnetic, ground-penetrating radar, seismic and induced polarization methods (Scollar, et. al., 1990). The most commonly used and available methods are: aerial/satellite photography, metal detectors, magnetometry, electrical resistivity/electromagnetic conductivity and ground-penetrating radar (Kvamme, 2003; Scollar, et. al., 1990). Magnetometry, resistivity, and GPR are all useful survey methods in historical archaeology. I will discuss each of these briefly with respect to their utility in Bates County.

Aerial/Satellite Photography

Aerial photographs have been taken since the early 1900's. The main advantage of aerial/satellite photography is that it can provide views of sites that typically have not been seen before (Wilson, 1982). Since aerial photography has a long history, many photographs are available through specialty archives and even on the internet. Unfortunately, these conventional aerial photographs were not readily available for the

sites in Bates County. Google Earth imagery is available, but provided no additional useable information for detecting foundations or other features at site 23BT1128 or 23BT1129.

Metal Detectors

Metal detectors are readily available and fairly inexpensive. Unfortunately, their usefulness is limited to relatively shallow depths, anywhere from ten to thirty centimeters, depending upon the size of the metal object detected (Dolphin, no date). With respect to the sites in Bates County, the amount of metal material (nails, wire, and other miscellaneous objects) made metal detecting a less than useful method for determining where features were located. While nail concentrations were larger in areas where structures were present, the presence of any metal objects was so widespread at both sides that it was not an efficient use of time to mark and register each individual "hit."

Magnetometry

Magnetometry detects local anomalies in the earth's magnetic field (Dolphin, no date). These tend to be created by phenomena such as the firing of the soil (beyond 600°C), accumulations of fired artifacts, and concentrations of iron oxides in the soil (Kvamme, 2003). Given the nature of the "Burned District," magnetometry was seen as a viable option for determining the location of features beneath the surface.

Electrical Resistivity / Electromagnetic Conductivity

The effects of various activities that change the composition and physical attributes of soils (i.e. void chambers within pyramids, loose piles of stones, masonry

walls, mine shafts, soil-filled pits or trenches, ditches, etc.) can sometimes be detected by changes in electrical resistivity or conductivity in the ground (Carr, 1982). Resistivity instruments have potential for detecting structures buried up to 1.5 m deep (Kvamme, 2003),and could therefore be another useful method in Bates County, as most of the features were beneath the surface at an unknown depth. Because of the preponderance of metal artifacts at both sites, it was determined that this method would prove useful when combined with magnetometry, in order to fine-tune the final results. As shown in the figure below (Figure 3.1), magnetometry registers a significant amount of metal material at the Straub site, but it is difficult to determine which areas are directly related to features (the known or suspected features are outlined in red). When the resistivity results are overlain with the magnetometry (Figure 3.2), a much clearer picture of site features is revealed.

Ground-Penetrating Radar (GPR)

Since GPR requires submitting a signal through the earth, soil conditions will affect the readings. For example, "Highly conductive deposits, such as moist clays, can greatly limit or impede GPR penetration" (Kvamme, 2003, p. 442). GPR is better suited for drier, and therefore more nonconductive, soils and sediments (Conyers, 2004). A more homogeneous environment is considered most effective for this type of survey (Archaeo-Physics, 2007). This was a significant drawback for the sites in Bates County, as GPR was not a highly recommended method for this area.

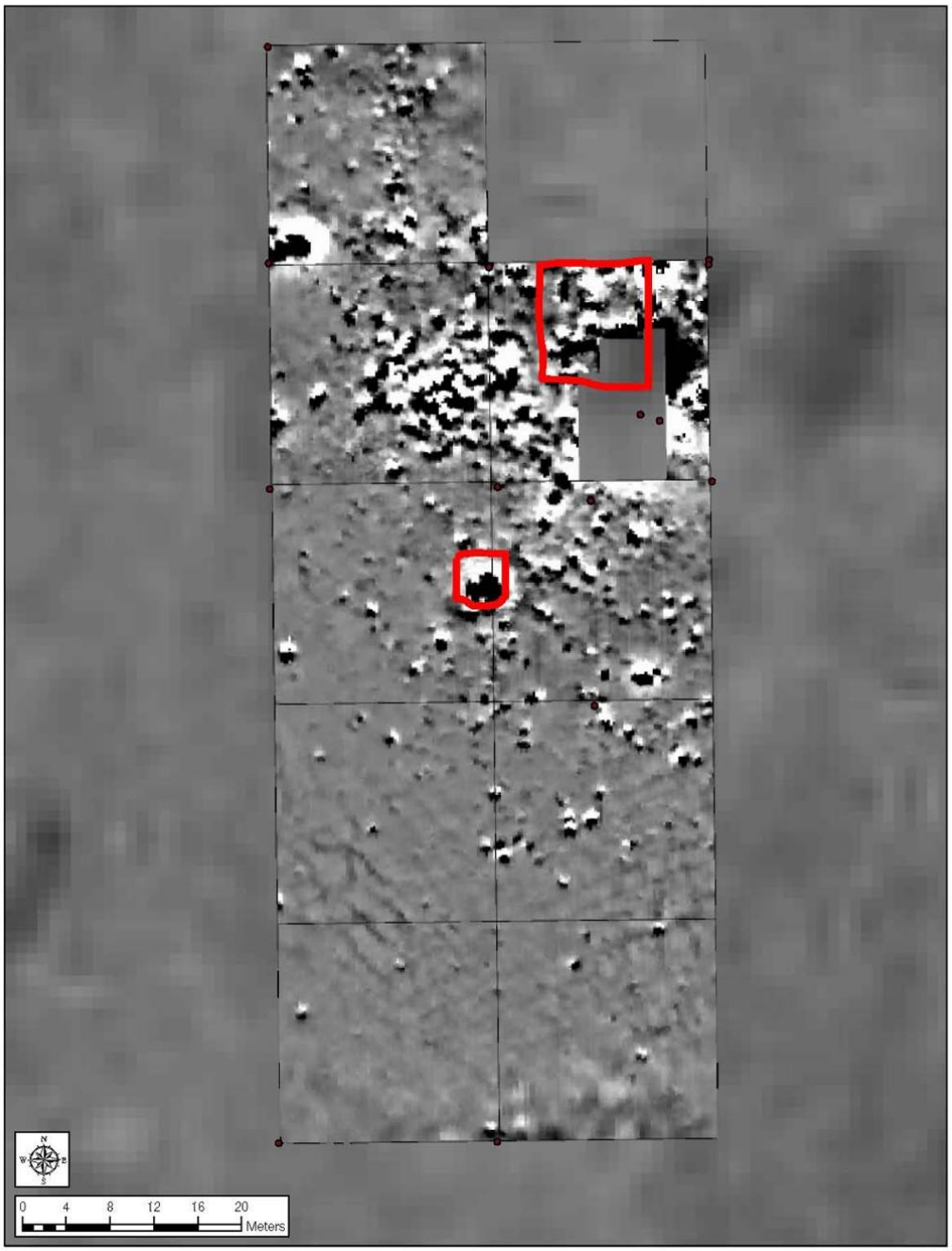


*Figure 3.1: Magnetometry Results – 23BT1128*

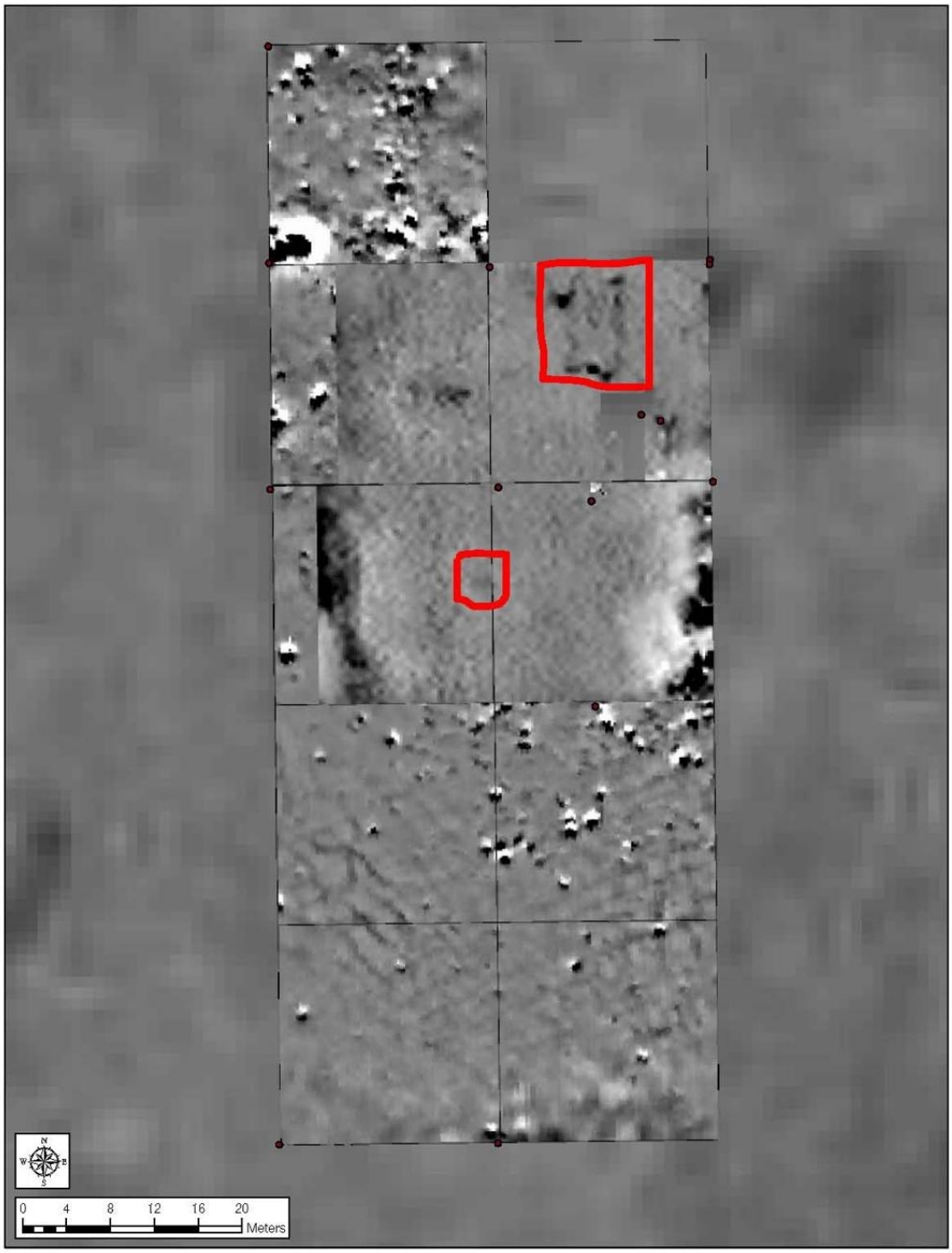


*Figure 3.2: Resistivity Results – 23BT1128*

Applications of Remote Methods in Bates County, Missouri

Neither aerial photography nor metal detecting proved to be useful or effective at either of the sites in Bates County. While aerial photography can be helpful in some situations, as mentioned earlier, it provided no additional information about features located on either site. With the large amount of metal at both sites, metal detecting also proved to be time-intensive and non-diagnostic when it came to determining the location of features.

The *Soil Survey of Bates County, Missouri* (Unknown, 1995) indicates that the soil composition is not terribly complex and is composed mainly of fine-loamy or fine-silty mixed soils. Silt-loam soils from the Kenoma-Hartwell-Deepwater association make up the largest percentage of the soil in the county (48.5%). The mixed nature of the soils, along with their fine-grained, highly conductive nature, suggested ground-penetrating radar would be less effective, and was not pursued as a method for locating features.

Resistivity methods were found to be effective because of the moist and fine nature of the soil and tendencies toward lower resistivity, increasing the chances of creating a greater contrast with buried features. As shown in Figure 3.2, the signature was large enough to generate an effective reading. The fact that many structures in the county were burned during the 1860's made magnetometry an attractive method, especially since metal tools and materials associated with historic did register distinct signals. On its own, however, magnetometry would not have provided sufficient information as to the specific location of features. It did prove to be helpful in determining the potential extent of the site itself.

Cost and available professional resources were an additional consideration in selecting geophysical survey methods. Funding and/or the lack of availability of qualified individuals impeded my ability to use these methods. My use of magnetometry and resistivity was limited to one day of donated equipment, labor and time from individuals who were interested in my project. Because of that, only a partial magnetometry and resistivity survey of 23BT1128 was done, and no work at 23BT1129 was possible. The limited work conducted at 23BT1128 did help to confirm that the excavation/testing methods used did accurately guide the research to the main feature areas defined by the geophysical survey. While geophysical survey can be extremely useful, when available, I did find that other "low-tech" excavation methods (as described in the next section) could be just as informative, in particular because the deposits at both sites were typically no deeper than 50 cm below the surface..

**Subsurface Research - Excavation Methods**

Invasive excavation can produce the most direct evidence of specific activities at an archaeological site (Orser and Fagan, 1995; Hume, 1969b; South and Widmer, 1977), and this was verified at these sites in Bates County. The most useful vertical excavation method for my purposes was coring, or auger testing. Area or block excavations were also employed, using both 1m x 1m blocks, and 50cm x 50cm blocks. In all of these methods, screening was used to find smaller artifacts such as buttons, needles, bullets, and other small household and personal items as well as remnants of charcoal as indicators of past burn episodes for a structure and small floral or faunal remains as indicators of diet or socioeconomic status. These are described in further detail below.

Auger Testing (Coring)

At both 23BT1128 and 23BT1129, a soil auger was extremely useful in finding artifact concentrations and/or signs of features. We did a series of core samples, using a 3" soil auger, to systematically dig down at set intervals. The excavated soil was then screened. A combination of random-aligned and interval-aligned core samples has shown to be useful at historic sites, and when compared with the amount of material found in excavated units it has proven to be a useful predictive tool (South and Widmer, 1977). This was shown to be the case at both 23BT1128 and 23BT1129 in Bates County.

Trenching

In many situations, such as at these sites in Bates County, archaeologists are faced with a large area to excavate, but with few (if any) visible features, little or no funding, and a shortage of manpower. In these cases, it is possible to use trenching to determine as much as possible about the character of the site and its foundations, without having to actually excavate the entire site by hand (Orser and Fagan, 1995). The heavy equipment needed was not available for this study, and therefore this method was not employed.

Area/Block Excavation

When resources allow, area/block excavation can be used to expose larger areas of sites, such as building foundations, trash heaps, etc. (Orser and Fagan, 1995). The size of the units can vary, depending upon the size of the area being excavated, but format Bates County the units were either 1 x 1 meter square or 50 x 50 centimeters square. It

was found that these smaller units were extremely useful in quickly finding feature locations and artifact distribution patterns.

In addition to targeting the building foundations for excavation, random sampling was used to place a series of excavation units in the transitional areas between buildings. It has been shown that farmsteads contain a large amount and wide variety of sheet refuse in these spaces (Moir, 1987c), and these materials were informative in the later analysis phase.

Screening

It is common practice for archaeologists in general to dry screen their excavated soil and the same holds true for historical archaeologists. The size of the screen will depend upon the nature of the expected artifacts, but the most common sizes are quarter-inch or eight-inch mesh. The smaller size (eight-inch) mesh is typically used when items such as glass beads and other similar sized artifacts are likely to be present (Orser and Fagan, 1995). Because of the clay content of the soil in Bates County, it was found that quarter-inch mesh was the most productive and useful size. Wet screening and flotation are also common and productive in many circumstances, but when tested on the Bates County assemblages they provided no additional data that was relevant to the analysis being done for this research.

### *Analytical Methodology*

A key component to historical archaeology, as in any type of archaeology, is being able to analyze the features and material culture at a particular site or series of sites.

With careful analysis, one can then determine what patterns, if any, are visible and what questions can be answered (or asked) based on the assemblage (South, 1977). With respect to my work in Bates County, there are three main categories of analysis that need to be done in order to begin identifying patterns and answering the questions posed in Chapter 1. These categories of analysis are not discrete, and necessarily overlap a great deal with each other. A brief description and discussion of each of these categories of analysis follows.

In addition, creating clear and consistent typologies for all artifact types is critical to any kind of archaeological analysis (Orser and Fagan, 1995; Barber, 1994; Little, 2007; South, 1977),. The categories for such a typology may vary depending upon the type and variety of artifacts encountered in a particular site and the questions being asked, but generally recognized groups of historic artifacts might include ceramics, glass vessels, architecture, personal items, faunal remains, thin metal, heavy iron, hand tools, firearms, stable gear, or miscellaneous (Moir, Green and Lebo, 1987). When attempting to determine the extent to which guerrilla warfare had an impact on the socioeconomic status of the residents in Bates County, these artifact types are necessary to this analysis.

### Identifying Structure/Site Type

The first category of analysis would deal with identification of the site type – whether it is a domestic, ancillary or commercial structure. This provides us with the overall framework within which to begin interpretation of the other artifacts. Since the main purpose of this research is to determine the effect of warfare on households, it is of absolute importance to determine whether these sites were households, or other non-domestic structures. While the historical documentation available in Bates County is of

great assistance in this endeavor, it is necessary to independently verify this based on the archaeological remains.

One way to determine the type of structure or site is to look at the distribution of artifacts found within a particular foundation or building site (Barber, 1994). The type and function of these particular artifacts are a strong indicator of the original purpose of the structure or site (South, 1978b). This proved to be the case at both sites in Bates County, as the type and distribution of artifacts coincided with the site use indicated in the available historical documents.

Another useful tool in determining site type is to compare the artifact assemblages and exposed features to similar studies done by others to find correlations. For instance, the Richland Creek project conducted in 1987 on rural sites in Texas contains detailed descriptions of rural industrial sites (Lebo, 1987c) and farmsteads (Moir and Jurney, 1987) that proved to be extremely enlightening for the purposes of comparison and diagnosis.

### Determining Age of Site/Occupation

The second category of analysis would be determination of the site's age. While historical documentation provides an expectation of a site's age, it is up to the historical archaeologist to look at the assemblage to determine what date range they actually represent. For this study, when the phases of occupation can be measured in decades, it is critical to determine if a reliable chronology can be determined for the sites, and whether the stratigraphy is relatively intact. One way this can be done is by looking at construction materials, such as nails and window glass. An archaeologist can look at the association of key artifact types, such as ceramics/stoneware, glass (bottles other vessels),

and metal objects (other than construction related objects) such as farm tools and equipment, household items (stoves, bed frames) or personal items (gun parts, buttons, hairpins and combs) (Lebo, 1987b). The assemblages at both sites proved to be extremely useful in this endeavor, as discussed in detail in Chapter V.

There are a number works from other historical archaeologists or collectors that are often quite useful. These include, but in no way are limited to, class works such as *A Guide to Artifacts of Colonial America* (Hume, 1969a), and *In Small Things Forgotten* (Deetz, 1996), as well as *Bottles on the Western Frontier* (Wilson, 1981), or *19th Century Ceramics…in the Eastern Ozark Border Region* (Price, 1979). Larger, more comprehensive works can also be found, like *American Industry and Manufactures in the 19th Century: A Basic Source Collection* (Unknown, 1971). This volume of materials has been compiled from U.S. government documents and is an overall census of manufactures, providing wonderful information on rates of production. This particular item can be difficult to find and is prohibitive to purchase (last seen priced at $1500 for the set). These resources, either in print version or available on the internet, were extremely useful in determining the age ranges of many artifact types found at both sites.

While it would not be feasible or productive to provide a breakdown of how to determine the age of every possible artifact type from historic sites, it is useful to provide a brief discussion of two key artifact types and their utility in this matter. For our purposes, a discussion of construction materials and ceramics will suffice to demonstrate the range of options and techniques.

### Construction Materials

Within the range of construction materials, some of the most widely analyzed and diagnostic pieces are nails and window glass. These materials not only have the ability to be well-preserved in a variety of sites, but they can have specific features that allow archaeologists to determine an age range for a structure. It may not indicate how long a structure was occupied, but it can give an indication of when the structure was built (or sometimes, repaired). The lack of nails can be an indicator as well, since many early structures did not require the use of nails for construction (Jurney, 1987a).

With regard to nails, there are two main types: cut and wire. Cut nails were products of hand manufacture and were available from 1815 (Adams, 2002). As a distinctive morphological feature, they typically have four sides, rather than being round (Carlisle and Gunn, 1977). Wire nails typically date from 1819, although many people generally use an 1850s date (Adams, 2002). It is important to keep in mind that simply using invention dates of certain types of nails does not guarantee an accurate analysis of the age of a site. It is important to also consider production dates. As mentioned earlier, wire nails were available starting in 1819, but they were not mass-produced until the mid-1880s (Adams, 2002).

In order to make good assumptions about the meaning of nails within a site, one must then look at the entire assemblage and the ratio of the two types of nails to each other. Nail seriation data have been compiled from previous excavations, allowing for the possibility of relative dating using the percentage of wire versus cut nails within a site (Jurney, 1987a). Previous studies have indicated that a site with less than 20% wire nails tended to date prior to 1888, whereas a those sites with 75% wire nails could be dated to

after 1895, and by 1902 the nail assemblage would be exclusively wire (Jurney, 1987a:90). While this study may not be accurate for providing exact dates, it did prove a useful method for relative dating purposes (Jurney, 1987a).

Another useful type of construction material is window glass. Window glass is commonly found in historic sites, particularly farmstead sites (Moir, 1987b). It has been shown that pane thickness can be related to the date of manufacture for structures built between 1810 and 1915, thereby providing a general date of construction for a particular dwelling (Moir, 1987b). Because of the potential for contamination from later occupations, this tool is most useful to rural sites of relatively short occupation. By paying careful attention to where the flat glass is found within the context of a site, and measuring the mean thickness, this method can provide some fairly accurate information about the date of construction of rural 19$^{th}$-century farmsteads (Moir, 1987b).

**Ceramics**

Another extremely important, and common, artifact category that can be used for dating sites/occupations is that of ceramics, or pottery. In general, pottery can be divided up into three different types: earthenware (soft, water-absorbent body which is then glazed), stoneware (hard-bodied, does not absorb water) and porcelain (highly vitrified white china) (Deetz, 1996). There are a number of ways in which ceramics/pottery can be dated, depending upon how much or what part of the original vessel is recovered. The date of manufacture of a piece of ceramic or pottery does not necessarily correlate to its date of use, but studies have shown that there is enough of a correlation to use ceramics as indicators of the age of a site (South, 1978a).

The most direct way to determine the date of a ceramic artifact is to identify an intact maker's mark. These maker's marks can be traced to the original manufacturer and possible dates of manufacture. When dealing with ceramic sherds, it is often the luck of the draw that determines whether these pieces will provide any maker's mark in order to do this type of analysis.

Another method is to compare various features of the sherd or vessel with other known pieces in order to get a date. These features would include paste type or color, surface glaze, decorative technique, background color, rim decoration, and design motifs and colors (Ceramic Type Collection, 2004). Knowledge of locally available ceramic types is also useful and provides a good basis for comparison (Lebo, 1987a; Price, 1979), as well as a knowledge of the types of ceramic assemblages that can be found at certain sites like 19th century farmsteads (Moir, 1987a). Additionally I have found that reference books meant for antique dealers and buyers provide good information about dates of manufacture for various kinds of pottery based on many of the same features named above, as well as maker's marks and patterns.

**Socioeconomic Status Indicators**

The third category of analysis that would apply is geared toward determination of socioeconomic status and standard of living. If it is to be determined that guerrilla warfare had an impact on standards of living, this category of analysis is the most critical. Many of the artifact types listed above for use in determining the age of a site can also be used to look at socioeconomic status, such as ceramics, personal objects (jewelry, hair combs), and window glass or glassware (types of products represented by the various

bottles, etc.). Various floral and faunal remains can also be used as indicators of socioeconomic status as they point to depth and breadth of the diet.

Also, like the artifact types mentioned in the previous section on determination of age, there are infinite permutations that could arise and a wide range of opportunities for inferring socioeconomic status. It would be prohibitive to even list them all here, let alone describe them in any detail. There are, however, a few techniques that historical archaeologists have at their disposal that provide data to allow for comparisons and inferences about economic and social status.

One method is to look at the relative value of objects that are found at a site, to give an indication of status. For instance, one can look at the cost and relative ease of procurement of various items to determine their relative value. This information can be found by perusing old Sears catalogs and other similar documents, inventory records from local dry goods or grocery stores, or by analyzing the assemblages of other sites in the area. A 1996 study of turn-of-the century whitewares (Manson and Snyder, 1996) provides a good example of this type of work, correlating types of assemblages in a variety of sites that have information about the economic status of the occupants. This kind of tool could then be used to look at other sites to determine if it is predictive.

If it is possible to determine the location of manufacture of various items, such as ceramics, glassware or food items, it would provide the historical archaeologist with information about the distance those items had to travel. The available transportation methods in the area (i.e., railroads or steamboats) would also provide information about how difficult these items may have been to procure. Information about rates of production within the established timeframe of the site provides excellent information

about the availability of these products. This information can often be gleaned from old government reports or from collections such as the *American Industry and Manufactures in the 19th Century: A Basic Source Collection* mentioned earlier (Unknown, 1971).

The type and variety of faunal remains that can be associated with food items should not be ignored as indicators of socioeconomic status. Using the same rules of determining relative value as stated above, this can be a useful indicator of socioeconomic status (Jurney, 1987b). Comparison with other contemporaneous sites can be extremely useful.

Another method is to look at the ratio of materials at a site over time, using established patterns such as the Frontier Pattern and Carolina Pattern (Resnick, 1988). These patterns look at the ratio of structural materials to household/kitchen goods. Initially conceived to determine site chronology in southeast sites, these patterns are also indicative of behavior, reflecting the choices being made at the household level about which resources require or can receive the most attention. This method does not rely on idiosyncratic determinations of value, but rather looks at overall increase or decline in consumer buying power and/or choice.

While not an exhaustive treatment of the analysis of socioeconomic indicators, these main points illustrate a few of the ways in which this can be done within the context of historical archaeology. For the purpose of this study, the most productive methods of analysis were those that focused on overall trends in socioeconomic status, rather than determining the value of individual items or assemblages.

### *Conclusions and Summary of Methods*

#### Research Methods

While there were a variety of historical documents that could potentially provide interesting and enlightening information, the documents that proved most useful were those providing assistance with location of sites. Local history books also turned out to be a productive source of information. Plat maps and tax records confirmed that these sites were used for domestic structures. In addition, surveyor's notes and census records were also helpful in this endeavor.

While all of the other documents might provide useful information, it was of primary importance to determine where best to dig. Other secondary sources such as local history books, cemetery records and, once again census records, were used to shed additional light on the specific site(s) being excavated and the individuals who lived there. For these sites in Bates County, probate records, grantor/grantee indices, newspapers, personal letters and diaries, and oral histories were either not available for all or portions of the time frame in question, or provided little detailed information.

#### Field Methods

Preferred field methods were determined based upon the specific site(s) chosen to excavate and the resources at hand. This included a combination of the applicable (and available) surface and subsurface techniques. When doing an initial investigation of each site, a surface survey was conducted.

The limited geophysical survey of the Straub site (23BT1128) proved to be useful in verifying the location of possible building foundations, thereby making the excavation phase much more productive and efficient. Overall, the three methods that proved to be

the promising for research in the area of Bates County, Missouri are Ground-penetrating Radar, Magnetometry and Resistance. Based on an initial examination of the soil properties of Bates County, Ground-penetrating Radar was the least desirable choice, and was therefore not used.

The remaining two methods, Magnetometry and Resistance, both provided similar but complimentary data. The soil conditions in general and the nature of the archaeological sites in question did lend themselves well to both methods. The advantages of using multiple survey methods was demonstrated in Figure 3.1 and 3.2, respectively. The geophysical survey that was conducted at the Straub site used both methods in order to offset the shortcomings of each. As mentioned previously, metal detecting was shown to be an unproductive method of determining the location of features at the site because of the prevalence of metal at and around the known features.

As for excavation methods, core sampling provided useful information about possible artifact distributions within each site, particularly for those areas/sites where surface artifacts were infrequent. Trenching was not necessary, nor was the required equipment available. Screening was used in conjunction with all excavation methods, using quarter-inch screen.

A more detailed description of the specific excavation methods employed at each site will be included in the next chapter (Chapter IV: Excavations).

### Analytical Methods

The specific methods used relied upon not only the type of site being excavated and the materials uncovered during the excavation, but also the primary research questions outlined in Chapter I. It has been shown that analysis can be done to determine

the type of site, the age of the site, and socioeconomic status. As is typical in the course of investigations on 19th-century rural farmsteads, the analysis focused on common building materials such as nails and window glass, and a variety of household items such as ceramics, bottle glass and other glass vessels, metal objects, personal objects, and faunal remains, particularly those that can be related to foodways.

All of these materials have shown themselves to be good candidates for the various types of analysis discussed here. As an historical archaeologist, judicious use of the available written documents, along with good archaeological techniques proved productive in illuminating the generally undocumented lifeways of 19th-century rural farmsteads. The specific analytical methods used will be discussed in more detail in Chapter V: Data Analysis.

I have included a two appendices that provide specific information on research avenues related to historical studies of rural occupations in Bates County. These include information on local organizations and research institutions (Appendix A), and a listing of local newspapers (Appendix B).

# Chapter IV
# Excavations

*"Hell, I don't break the soil periodically to 'reaffirm my status'. I do it because archeology is still the most fun you can have with your pants on."*
Kent V. Flannery. 1982. The Golden Marshalltown. *American Anthropologist* 84:265-278.

## *Introduction*

In order to address the primary research questions, I needed necessary to find relatively undisturbed sites with intact stratigraphy and a rich deposit of cultural material. The history of Bates County indicated that these conditions could be met and initial research and outreach began in June of 2007. I used information provided by property owners in Bates County to identify two sites in the vicinity of Amsterdam, Missouri: the Straub site (23BT1128), and the Limpus site (23BT1129), the latter sometimes referred to as the Clark site (Figure 4.1). Both sides were identified initially by the presence of a hand-dug stone-lined well on the property. Additional historical documents, consisting of tax records and plat maps, indicated that both sites were occupied and used as farmsteads during the Border War period.

West Point, Missouri, which existed from 1850–1861, would have been the largest nearby town during the time of their initial occupation. It was located within a mile of both of these sites (Unknown, 1883; Atkeson, 1918). Before its destruction, West Point was one of the largest cities in Bates County, and boasted several hotels, a grocery, three daily mail deliveries, newspapers, mills, and a variety of other businesses (Unknown, 1883; Atkeson, 1918). In 1861, Jim Lane and a band of Union soldiers burned West Point to the ground, and after the enactment of General Order No. 11 in 1863, the town never recovered (Atkeson, 1918; Neely, 2000). It wasn't until 1891, when

the town of Amsterdam was incorporated, that another town was built in the general area (Atkeson, 1918; Neely, 2000).

*Figure 4.1: The Straub and Limpus (a.k.a Clark) Sites*

Based upon the conclusions drawn in Chapter 3: Methodology, a sequence of testing and excavation techniques was used to sample the Straub and Limpus sites. In keeping with standard archaeological practice, a grid system was created for designating the provenience of all activities. All such datum points were left in the field for reference by possible future excavations. These lines, and all subsequent measured points, were created with a Berger Model 2T, 24X optical surveyor's transit (Figure 4.2). All units within the grid are referenced from the southwest corner.

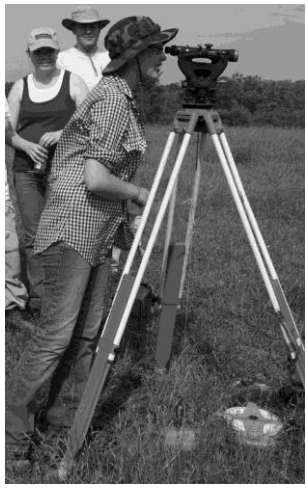

*Figure 4.2: Surveyor's Transit*

An initial survey, including surface reconnaissance, auger testing and two 1x1 meter test units, was completed in October 2007 at both the Straub and Limpus sites, and basic sketch maps were created. Both sites revealed mid-19th century material as well as late 19th and early 20th century material. The Straub site also revealed a burned foundation wall. Hand-dug and stone-lined wells/cisterns are present at both locations (Figures 4.3 , 4.4 and 4.5).

Historical documents indicate the presence of structures at both sites during the time period in question. Limpus seems to have been occupied from the 1830's until at least 1877, and was the site of a grocery store at least during the 1840s and possibly the 1850s. Historical documents have the J.J. Clark family living on property during time of Border Wars and after, and county tax records correlate. At the Straub site, county tax records and plat maps also indicate occupation by the John Greene family during the time of the Border Wars and the later Reconstruction.

*Figure 4.3: Stone-lined well at the Straub site, with 1 meter square for scale*

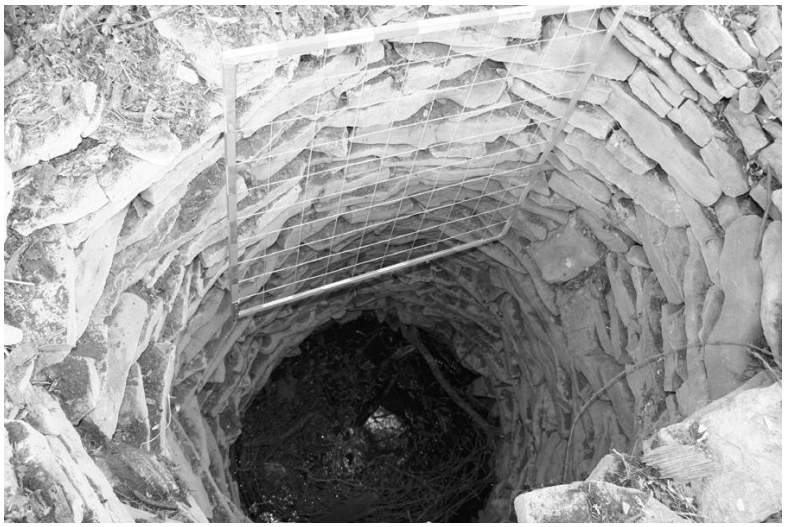

*Figure 4.4: Interior of well at the Straub site, with 1 meter square for scale.*

Extensive excavation of the sites was conducted in June of 2008, October of 2008 and June of 2009 using standard archaeological procedures, consistent with the Richland Creek project (Jurney, 1987c; Jurney and Glaspy, 1987; Lebo, 1987c; Moir, 1987c; Moir and Jurney, 1987), as well as the work of Otto (1975), Resnick (1988) and Schoen (1990) for comparative purposes. Excavations were carried out in collaboration with the Bates County Historical Society. Auger testing was used to locate artifact concentrations, using a 10 cm diameter bucket auger. Auger samples were extracted in 10 cm increments until encountering bedrock, approximately 50 cm below the surface. This method was used to

obtain information about the density of artifacts and cultural features in the site's soil/sediment matrix. Excavation was conducted in 50cm x 50cm and 1mx1m units at each site in arbitrary levels. All excavated matrix samples were processed using ¼-inch (.635 cm) mesh screens. Soil samples were gathered from each excavation unit for possible further analysis. All artifacts were recorded by provenience, collected, and cataloged. Observation was made of the site's soil/sediment characteristics. Field excavations were documented with field notes, digital photos, maps and sketches. All artifacts are curated at the University of Kansas, in the archaeological collections of the Biodiversity Institute (Spooner Hall). A summary of the artifact assemblages for both sites is included in Appendix F.

*Figure 4.5: Stone-lined well at the Limpus site*

***Geophysical Survey***

On May 23, 2009, Grant and Chuck Day from AMEC (located in Jefferson City, Missouri) brought a volunteer crew to conduct a resistivity and magnetometry survey of the Straub site. As only one day was allotted for this work, consultation with Grant Day about the nature of each of the two sites, including topography and soil, led to the conclusion that the Straub Site was the best candidate. The purpose of the geophysical

survey was twofold: to test its utility in similar historic sites, and also to help determine the best possible locations for further excavation during the 2009 field season.

For comparative purposes, resistivity was used in addition to magnetometry in order to utilize independent sources of data and in so doing mitigate the effects anticipated from a high probability of metal artifacts and features scattered throughout the site. Using the datum established in 2007 for the initial site survey and test excavation, a grid was established over a 40 x 40 meter area for the resistivity survey, and a 40 x 100 meter area for the magnetometry survey. Because of the increased time needed to conduct the resistivity portion of the survey, a smaller subset of the geophysical grid was used, focused around the known area of the foundation.

Excavations at the Straub Site in 2007 and 2008 (described in detail later in this chapter) uncovered a portion of a burned foundation. Using the magnetometry (Figure 4.6) and resistivity (Figure 4.7), we hoped that additional information about the size, shape and orientation of this structure could be provided. We also hoped that additional subsurface features would be indicated that could then be tested during the 2009 field season.

*Figure 4.6: Magnetometry survey at the Straub site*

*Figure 4.7: Resistivity survey at the Straub site*

The results of the magnetometry survey are shown in Figure 4.8, and the resistivity results are shown in Figure 4.9.

Both the magnetometry and resistivity surveys indicate a large rectangular anomaly in the area where a foundation had already been partially excavated (in the northeast portion of the grid, indicated by a red outline). While this discovery was certainly no surprise, it did help to confirm the size and the shape of the foundation, at approximately 3m x 8m. In addition, an email from Grant Day (June 1, 2009) indicated the possible presence of two chimneys – one in the southeast corner, and one in the northwest. This evidence confirms its use as a domestic structure, rather than a farm out-building or other utilitarian building. In this same email, he goes on to say:

> The resistance data appears to show some sort of internal anomaly as well along the northern half of the house, possibly a shallow root cellar. The magnetic data appears to indicate that the foundation is made of limestone. It is possible that the northwest chimney pad is made of brick or is heavily fired---based on the high magnetic signature that appears to correspond to this section of the house foundation.

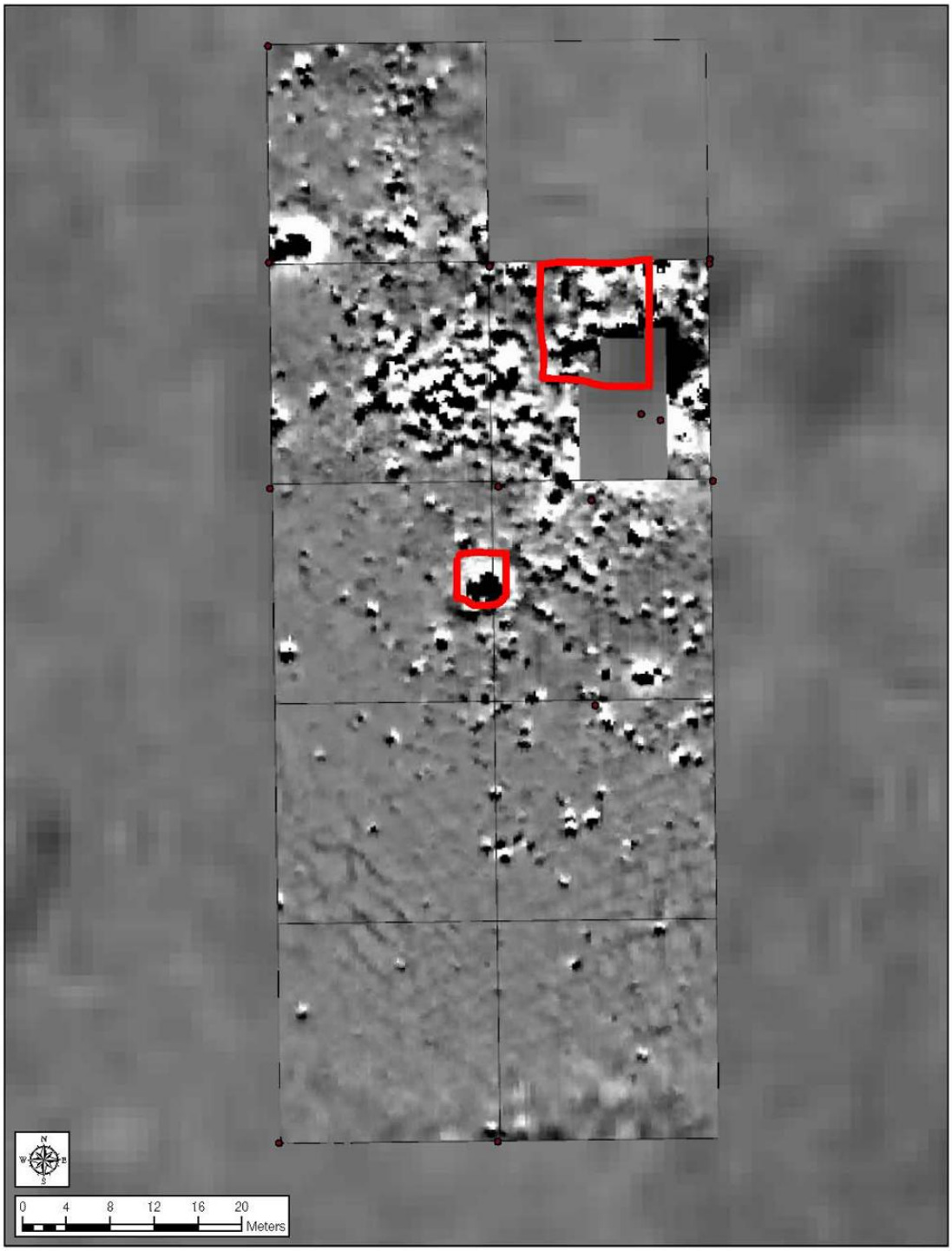


*Figure 4.8: Magnetometry results – the Straub site*

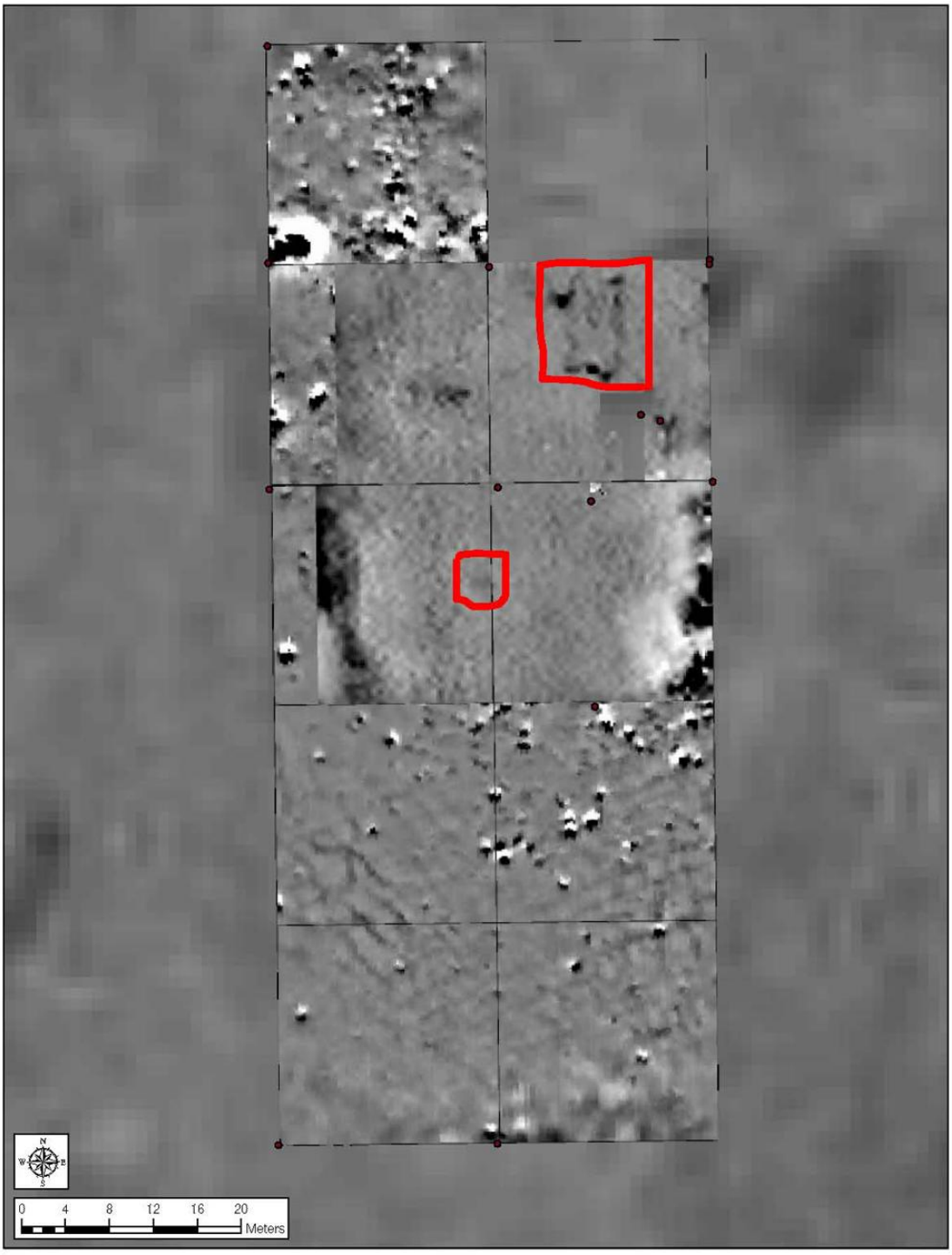


*Figure 4.9: Combined Magnetometry and Resistivity results – the Straub site*

The second anomaly, a small square shape in the southwestern portion of the grid (indicated by a smaller red outline) is outside the area that had been investigated in either 2007 or 2008. Grant Day and his colleagues postulated that its signature indicated it could either be brick, heavily fired, or filled with dense metallic debris. This area of research will be discussed in the next section.

***The Straub Site (23BT1128)***

Concrete-and-nail datum points were established at the Straub site. Two such points, a primary datum and back-sight, were set at grid coordinates 12 m west/20 m north (12W/20N- primary datum) to 12 m west/37 m north (12W/37N back-sight). The line between these points, aligned on magnetic north, served as the principal sampling transect for the Straub site.

**2007 Field Season**

An initial walking survey of the site was conducted in July of 2007, looking for surface concentrations of artifacts that would point to a possible 19th century occupation. These surface artifacts were noted as concentrated primarily around the well situated at the top of the hill at the site. Since the site was actively being used as a cow pasture at the time, pin flags were not left in place to indicate the location of artifacts. Significant clusters of artifacts were noted on the primary site map.

A test excavation of the site was conducted October 11-14, 2007, which consisted primarily of auger testing along an east/west and north/south transect. The auger testing along the east/west transect began at 13E/30N, and continued at 1-meter intervals until

5W/30N, at which point it continued at 2 mcm intervals until 25W/30N. Another auger hole was located at 28W/30N, and the final auger on the east/west transect was located at 47W/30N. Two additional auger holes were located along the north/south axis at 15W/29N and 15W/25.5N. Each auger hole was investigated until a sterile layer was reached, but in no case was this below 50cm. A total of 33 auger holes were investigated during this test.

The auger testing uncovered a significant amount of rock, particularly in the area starting at about 11W/30N and through approximately 15W/30N, as well as a small amount of burned wood near the surface. Domestic debris, including ceramics, glass and personal items, as well as significant amounts of coal and slag, were found throughout the site. The persistent presence of rock indicated a possible foundation beneath the surface. Because of time constraints during this test excavation, a soil probe was then used to detect rock formations under the surface in the area where it seemed most pervasive. Pin flags were then placed in areas where rock was detected, and a rectangular pattern was established (Figure 4.10).

*Figure 4.10: The Straub Site foundation*

A single $1m^2$ test unit was excavated (11E/13N) in 10 cm arbitrary levels, down to 20 cm in depth. Very little cultural material was found in this excavation unit, and additional excavation of this unit was suspended in favor of further investigation of the foundation.

Every excavation level of each unit was described in unit-level forms, with observations as to context, disturbance levels and sediment characteristics recorded. In all cases, the objective of subsurface sampling was to determine cultural components, the horizontal and vertical distribution of artifacts and, where encountered, cultural features, and the degree of site preservation. Photographs were taken of features, when present, or of artifacts found in situ. All artifacts recovered by auger testing and excavation were sent to the lab for cataloging (Appendix C). These procedures were also followed for the subsequent 2008 and 2009 field seasons.

**2008 Field Season**

Extensive excavation of 23BT1128 began in June of 2008 with a three-week field school co-sponsored by the University of Missouri-Kansas City and the Bates County Museum. The auger testing and soil probe information from the 2007 test excavation was used to direct the location of the excavation units. $50cm^2$ as well as $1m^2$ units were excavated at each site in 10cm arbitrary levels, and screened over ¼ inch mesh.

At the Straub site, a total of 33 auger holes, along both a north/south and east/west transect, were used for testing. During the course of the June 2008 field season, eight 50 x 50 cm and seven 1x1 meter pits were excavated (Figure 4.11). With the exception of one unit (a possible root cellar), sterile levels were encountered at around 30 – 40 cm. A

foundation, consisting of stone piers and some wood remains, was found. Strong evidence of burning is present, and the foundation is approximately 5 x 6 m, with the longest sides of the rectangle running north/south.

The site has not been extensively plowed, and has primarily been used for pasture. Because of this, in spite of the relatively shallow nature of the deposits, there is a good amount of stratigraphic integrity.

**2009 Field Season**

Work continued in the same fashion for the 2009 season during the month of June. While in June of 2008, the entire three week period was dedicated to the Straub Site (due to weather considerations), the 2009 season was split between the Straub and the Limpus Sites. The primary focus of the 2009 field season was to ground-truth the geophysical survey that had been conducted in May of 2009. The excavations concentrated on uncovering at least one, if not two, additional corners of the foundation, to verify its size and shape. To this end, an additional 11 $1m^2$ units were excavated.

In addition, the second (smaller) anomaly from the geophysical survey was investigated using auger testing with the same 10cm diameter soil auger as before. A grid was established on a north/south transect from 12W/8N to 12W/24N, and along an east/west transect from 12W to 24W. A total of 25 auger holes were tested, spaced 2 m apart along the east/west transect, and 4 m apart on the north/south transect. In the area specifically indicated by the resistivity and magnetometry surveys as high probability, an additional line of auger holes was placed 2 m apart along the north/south transect as well.

No structural features were encountered, and artifacts concentrations were light, when present at all. This second anomaly could not be verified as a cultural deposit.

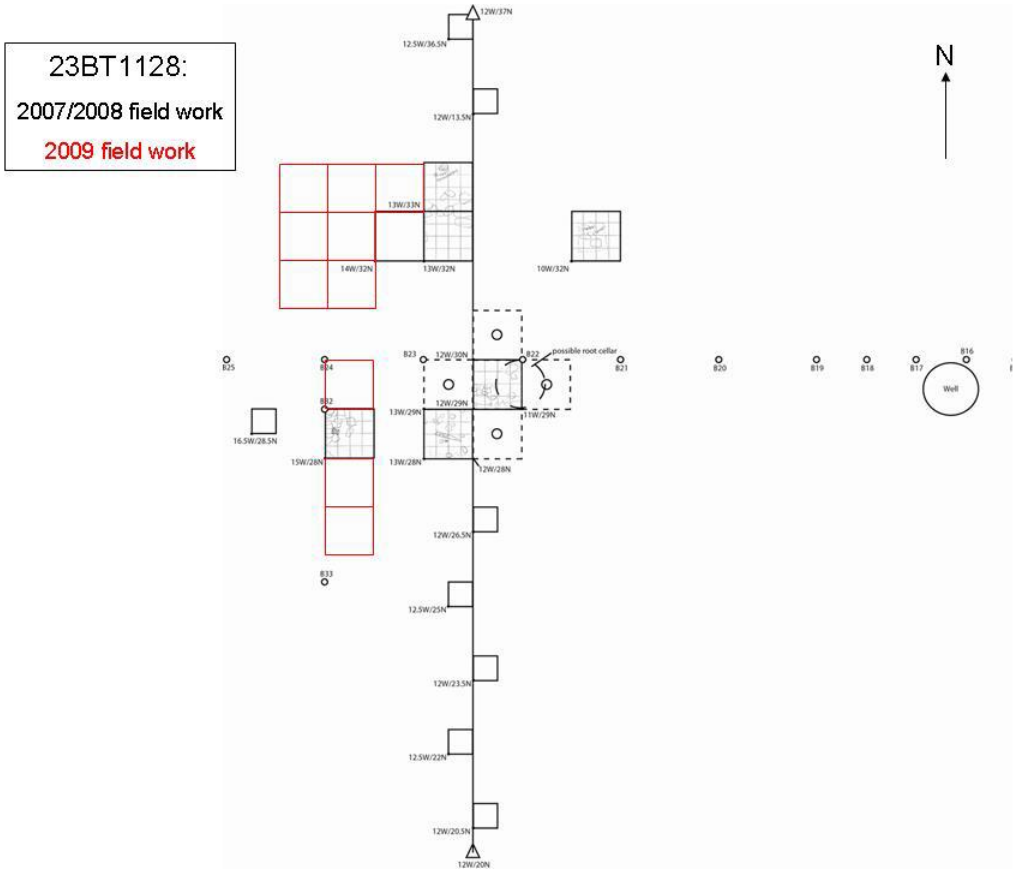

*Figure 4.11: Straub site excavation units*

***The Limpus Site (23BT1129)***

Access to the Limpus site is through a low-lying area that floods during periods of heavy rain. When this is the case, it is impassable for vehicle traffic, and the movement of the necessary excavation and survey equipment. Because of heavy rains during June of 2008, it was not possible to conduct excavations at the site during the course of the three-week field school. Site testing, therefore, was conducted over a four-day period in October of 2008.

Concrete-and-nail datum points were established at the Limpus site. Two such points, a primary datum and back-sight, were set at grid coordinates 0 m east/0 m north (0E/0N- primary datum) to 0 m east/10 m north (0E/10N back-sight). The line between these points, aligned on magnetic north, served as the principal sampling transect for the Limpus site. During the 2009 field season, as excavations expanded, a secondary back-sight was established at coordinates 6 m east/15 m south (6E/15S – secondary back-sight).

Because the well at this site was situated within a dense clump of trees and undergrowth, it was not known whether the cultural material would be to the north or the south of the well. Since there was not a clear line of sight through the trees, the initial datum was referred to as 23BT1129A, with the understanding that a second datum to the south of the trees might be needed, which would be designated as 23BT1129B. Surface survey of the area to the south of the trees detected no visible artifact concentrations. Additionally, due to the time constraints at the site and the discovery of intact features, work was focused entirely within the sight of the original datum. The artifact catalog contains reference to 23BT1129A, to allow for the possibility of work in the area to the south of the trees in future field seasons, but for the sake of discussion here, it shall be referred to simply as the Limpus site.

**2008 Field Season**

The test excavation at the Limpus site that was conducted over four days in October of 2008 (Figure 4.12) provided similar material to the Straub site, which also indicated a mid-19$^{th}$ century occupation, as well as a late-19$^{th}$ century or early -20$^{th}$

century component. For the initial test of the site, a total of five auger holes and eight 50cm$^2$ test pits were excavated. Because this site is at the base of a slope, the deposits were more deeply buried than at the Straub site, with the cultural layers continuing down to 50 cm or more in some areas.

*Figure 4.12: Limpus site test excavation*

While no structural features were found during this test excavation, the amount of domestic debris present in the units indicated that further investigation was warranted. Material was found that pointed to not only a Civil War-era occupation, but also possible evidence of the 1840s grocery store was present in some units (including bulk lead bar, sold for the purpose of making ammunition, as well as large amounts of crockery and container glass).

As with the Straub Site, every excavation level of each unit was described in unit-level forms, with observations as to context, disturbance levels and sediment characteristics recorded. In all cases, the objective of subsurface sampling was to

determine cultural components, the horizontal and vertical distribution of artifacts and, where encountered, cultural features, and the degree of site preservation. Photographs were taken of features, when present, or of artifacts found in situ. All artifacts recovered by auger testing and excavation were sent to the lab for cataloging (Appendix C). These procedures were also followed for the 2009 field season.

**2009 Field Season**

Work continued in the same fashion for the 2009 season during the month of June. As indicated earlier, the 2009 season was split between the Straub and Limpus Sites. The landowner allowed the wooded and overgrown area around the well to be cleared for the purposes of the excavation, so we had clear access to this area for the first time.

Expanding upon the work done in the fall of 2008, five of the $50cm^2$ units were expanded into $1m^2$ units to further determine if any structural remains were present. Three additional $1m^2$ units were also excavated in this area (2 units to the south and east of the primary datum, and 1 unit to the south and the west of the primary datum). A soil probe in the area to the east of the well indicated a large rock feature beneath the surface. In all, a total of 13 one $m^2$ units were excavated in this area, uncovering a fitted stone floor. Figure 4.13 shows the extent of the excavations at the Limpus Site, and figure 4.14 shows the fitted stone floor.

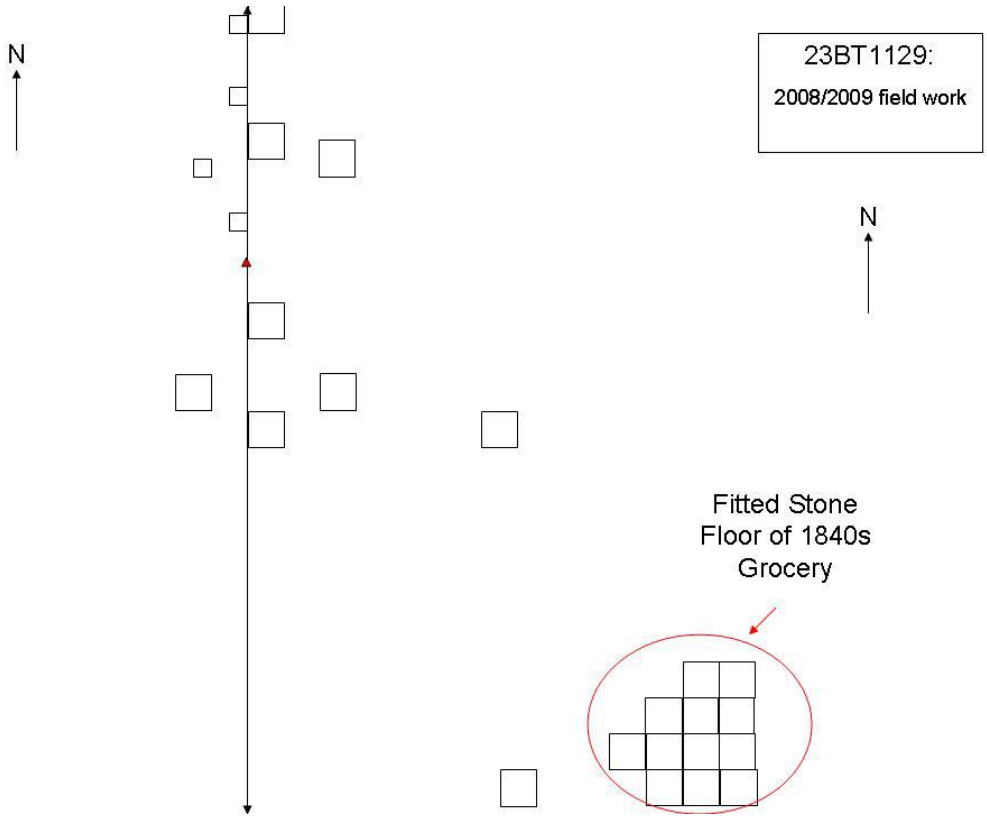


*Figure 4.13: Limpus site excavation units*

*Figure 4.14: Limpus site fitted stone floor*

The material culture of the Limpus site is very similar to that of the Straub site, with two specific differences. First, the Straub site contains a large amount of flat glass, while the Limpus site has provided relatively few pieces of flat glass. Second, the Straub site produced little in the way of faunal material, while the Limpus site has a very rich faunal component, consisting primarily of pig or pig-sized bones, along with some chicken, rabbit, and possibly deer. The other categories of cultural material, including ceramics, bottle glass, gun parts and other personal and domestic items, show distinct similarities with the assemblage at the Straub site, as will be discussed in Chapter V: Data Analysis. As mentioned previously, a summary of all the cultural material is provided in Appendix F.

# Chapter V
# Data Analysis

*"It's not what you find; it's what you find out."*
David Hurst-Thomas (1989). *Archaeology*, Holt, Rinehart and Winston. 2nd edition, p. 31.

## *Introduction*

As stated in Chapter 1, the primary goal of this research is to understand and define a baseline pattern of socio-economic response to chronic warfare on the 19th century Missouri/Kansas border, in order to establish an interpretive and predictive model which can be used for this and future fieldwork. In that little work has been done to date on the impact of chronic warfare on civilian populations within the context of the American Civil War, and no work of that kind has been done in Bates County, Missouri, it is necessary to create an initial pattern against which future work may be compared in order to create a more broadly based interpretation in the future.

The first critical research question concerns chronology, and whether it is possible to fine-tune temporal control in order to reliably associate materials with the period in question (approximately 1855-1865), and the period of reconstruction that came after (primarily post 1870). This comparison is critical in differentiating between socio-economic responses within a given period. The sites involved in this study were occupied over the span of 50-75 years, with three distinct phases being represented (pre-war, Civil War, and post-war). The majority of the deposits at both sites were no more than 40 cm in depth, meaning that chronological control is of utmost importance for purposes of comparison between these phases. It is for this reason that the question of chronology takes primary importance in this study. While a full analysis of socio-economic responses to warfare will require a great deal of further research in the area, it is necessary to

determine – first and foremost – if sites in the Bates County area can reasonably be expected to have enough stratigraphic integrity to make these comparisons a realistic endeavor.

It is important to understand the nature of the evidence which typically informs this process. Archaeological data from 19th century farmsteads frequently includes artifacts indicative of time (often measured in decades), structural remains associated with dwellings and other buildings, and artifacts characteristic of domestic and agrarian activities. Artifacts such as nails, ceramic and glass fragments, food bones, metal implements and others are commonly encountered. These data rarely point to specific individuals or events. Events of short duration, such as the brief occupation of the Straub site by the Green family in the years leading up to the Civil War, or the brief period of time prior to General Order No. 11, are unlikely to deposit large numbers of artifacts, making archaeological interpretation difficult on the basis of small samples of excavated material.

Conditions of post-deposition preservation play an important role in determining the character of archaeological deposits. Modern, ground-disturbing activities frequently have degraded the integrity of historic archaeological sites, by plowing and other farming or construction-related activities. For sites with very shallow deposits, such as these in Bates County which typically are no more than 40 cm in depth, this is a real risk. By using a variety of material types, it is possible to use overlapping data sets to determine general chronological trends in the deposits, and to determine if there is, indeed, enough chronological control for this kind of research. The data sets that will be discussed below include window glass, nails, ceramics, gun parts, and other glass. Faunal remains will

also be taken into consideration as a peripheral data set, but nonetheless an interesting one.

The second question concerns the ability to establish reliable indicators of economic status. As stated above, a robust pattern will require additional work over many years. But initial trends will help to establish a preliminary framework within which to conduct further research, something which has not yet been established for sites such as these in this area. Therefore, a critical factor here is to look at national, local, and individual trends with respect to patterns of consumption.

With the ability to demonstrate chronological control, and also to indicate the beginnings of some socio-economic patterns, the first hypothesis can begin to be addressed:

***Hypothesis 1) A pattern of economic response to long-term chronic warfare on the Kansas-Missouri border can be defined and differentiated from economic patterns during the later period of recovery and reconstruction.***

Once that initial pattern has been established, and the framework for future work delineated, the second hypothesis also becomes feasible:

***Hypothesis 2) The archaeological record will be able to provide a depth and type of data that cannot be found in the existing historical record.***

Much of the written record for the pre-war and Civil War periods has been destroyed. Therefore, archaeology certainly has much to offer.

To begin with, the laboratory methods used in this data analysis merit a brief discussion. This will be followed by a discussion of chronology and socio-economics at

the two sites involved in this study. A summary of the findings will be included at the end of each section, and overall conclusions will be addressed in Chapter 7.

### *Laboratory Methods*

The extensive and diverse artifact assemblage recovered from excavation and auger testing at both sites was analyzed in detail, and classified consistent with the Richland Creek project (Lebo, 1987b; Moir, Green and Lebo, 1987) for comparative purposes (See Appendix F). Flat window glass served as important tool in fine-tuning the chronology of the site, and was analyzed following procedures outlined by Moir (1987b) and Schoen (1990), and validated by Weiland (2009), as shown in Figure 5.1.

| | |
|---|---|
| **Mean/Mode** | Mean |
| **Applicable Date Range** | 1810 to 1920 |
| **Number of Sites Used to Produce Method** | 45 |
| **Location of Sites** | South and northeast U.S., Texas |
| **Increment of Measurement** | 0.01 mm;<br>1 measurement (assumed) |
| **Region of Application** | South and northeast U.S., many sites in Texas |
| **Sample Sizes** | 15 to 20 pieces of glass can produce viable results, above 30 pieces is recommended for reliable results;<br>Largest sample noted was 659 pieces |
| **Strictures and Exclusions** | Select best possible context of glass from site, as opposed to seeking larger samples:<br>Foundation lines are best;<br>Scatters immediately next to walls are acceptable;<br>Only when glass from foundation lines or in scatters next to walls is not available should other glass be used;<br>Exclude glass from trash pits;<br>Confirm the structure was built after 1800 and before 1920;<br>Confirm the glass is flat by placing the glass on a flat surface and attempting to "rock" it back and forth by placing light pressure on opposite edges;<br>Confirm the glass is flat by letting light play across it;<br>Make sure the sample is window glass by eliminating potential bottle glass, mirror, or decorative glass shards:<br>Confirm glass is actually flat on both surfaces;<br>Confirm that glass bears no ripple marks which would indicate it was made in a bottle mold;<br>Confirm glass shards do not have beveled edges which would indicate the glass was decorative;<br>Confirm glass does not have silver backing indicating it is from a mirror;<br>Closely inspect glass that is pink or perfectly clear as it has a high probability of not being window glass;<br>Discard data when all pane thicknesses are greater than 3.2 mm |
| **Data Processing** | Collect measurements from a subsample of site according to sampling criteria, average all the values and insert that value in place of the *TH* variable in Moir's regression formula |
| **Dating Formula** | $ID = 84.22\ (TH) + 1712.7$<br>where *ID* = date of site construction (±7 years)<br>*TH* = thickness in 0.01 mm |

*Figure 5.1: Moir's Window Glass Protocols (from Weiland, 2009:37)*

This material was sorted as specifically as possible to place it within a time range and socio-economic scale. I analyzed ceramics following procedures outlined by Lebo (1987a), Manson & Snyder (1996), Miller (1980, 1991), Moir (1987a), Otto (1975, 1977), Price (1979) and South (1978a), and include information regarding the type of ceramic as well as its potential origin or place of manufacture. This is important in helping to determine patterns related to potential restriction or expansion in trade. As an additional factor in maintaining temporal control, I analyzed nails using data from Adams (2002), Carlisle and Gunn (1977), and Jurney (1987a).

Bottle glass makes up a significant part of the archaeological record. I analyzed intact bottles and those fragments large enough to be diagnostic and classified them consistent with the Historic Glass Bottle Identification and Information website maintained jointly by the Bureau of Land Management and the Society for Historical Archaeology and Wilson (1981). I classified other bottle glass fragments as specifically as possible and weighed them in order to determine a gross figure for quantity of consumption. I classified the gun parts found at both sites consistent with the techniques used at Richland Creek (Moir, Green and Lebo, 1987) for comparative purposes, using information from Gluckman (1965), Hicks (1940, 1961), Hogg (1985), Horn (1962), Hoyem (1981) and Lewis (1960, 1972).

I analyzed and classified all faunal remains from the excavation units, including those remains recovered in 1/4 inch mesh, consistent with Jurney (1987b) for comparative purposes. My analysis includes identification to the most specific taxonomic level possible using comparative collections at the University of Kansas, with the assistance of fellow graduate student Mark Volmut. The sex and age (juvenile, subadult,

and adult) of farm animals were determined whenever possible. Standard zoological measures (MNI and weight) were used to quantify the remains. This level of faunal analysis is an important factor in reconstructing economic status and restriction of subsistence practices at these sites.

The text-based sources for obtaining chronological information for these artifact types are cited within this chapter. All other sources, including web-based sources, are cited in the Master Artifact Catalog. I analyzed and cataloged all materials according to a cataloging system developed by Dr. Mary J. Adair for curation at the Archaeological Research Center, Spooner Hall, University of Kansas Biodiversity Institute.

### *Chronology*

#### The Straub Site (23BT1128)

##### Window Glass at the Straub Site

A number of studies conducted over the last 40 years show that window glass fragments offer one of the most robust means of dating 19th century structures. Thickness of window glass (owing to means of manufacture) progressively increased during this period (Moir, 1987; Weiland 2009:29). Several investigators have developed mathematical formulas (regression analysis) which estimate the age of glass manufacture, based on the thickness of glass fragments (see Schoen 1990, Day 2001 and Weiland 2009 for a comparison of these methods). Testing of these formulas with glass of known manufacture shows that 19th century window glass fragments can be dated accurately within known error ranges (ca. +/- seven years; see Day 2001; Weiland 2009: 31). As noted by Weiland (2009), the glass dating protocols (shown in Figure 5.1) developed by

Moir (1977, 1987) are widely used by researchers owing to their rigorous criteria for selection of glass samples.

The flat glass was analyzed for the entire site by unit, and by level, as a method for testing the stratigraphic integrity of the site, and to determine which levels could be reliably associated with a given period. While there is bound to be some amount of overlap, and flat glass alone does not give a definite chronological time stamp for a unit or level, the overall trends in how the date ranges group themselves are informative in determining an overall timeline for the site.

Using the protocols set out in Weiland (2009), based on Moir's work (1977, 1987), the results of the date formulas have been graphed to include the units which contained (at least marginally) significant numbers of flat glass fragments. While Moir's protocols establish a baseline of 15-20 pieces of flat glass in order to have viable results (the number of pieces of a certain size is more important than total weight as one cannot be sure that all pieces smaller than one inch in size are window glass, rather than glass from a panel bottle, for instance), not all of my units contained this minimum number in each level. However, when a unit did have that many, or approaching that many, I included that unit in the graphing for all four levels, for purposes of comparison. The 0-10 cm and 10-20 cm levels contained the largest quantities of flat glass. The same units, with a few key exceptions, contained little or no flat glass in the 20-30 cm and 30-40 cm levels.

This overall pattern makes sense chronologically given the periods in question. Early frontier homes would probably not have large amounts of window glass. In fact, some early frontier homes (prior to the Civil War) may not have had any, given the

difficulties of transporting such fragile goods using primarily overland travel. It would be expected, then, that the bulk of flat glass would appear in the levels dating after the Civil War. These "common sense" assumptions do still need to be fortified with the actual archaeological data.

The following series of graphs shows how the date ranges are distributed over the units and levels which contained the largest quantities of flat glass. It is interesting to note that these units are all situated along foundation lines. Also, unit 12W/29N has been identified as the location of a possible root cellar, and therefore the contents of this unit are highly mixed. Additionally, unit 15W/27N contained a trash pit, which also shows a significant amount of mixing. These two units have been included in the graphs since their contribution to the overall pattern, even if the data specific to those units is mixed, is still informative.

It is important to take note of the strongest date signatures within each unit, and to also look at the number of pieces in each sample. Also, the overall trend at the site is a highly important factor. While an individual unit may show signs of some disturbance, the overall integrity of the site is still relatively intact.

As stated earlier, it would be in keeping with mid-19$^{th}$ century frontier construction to have few or no windows. The lower levels at the Straub site bear this out in having little, if any, flat glass. With what we know of the history of the site, the earliest structures would have been built in the early 1850s. The "trash pit" unit (15W/27N) does have a mixture of flat glass ranging from 1850, all the way up to 1920. This is expected since it is a trash pit (likely created after the site was no longer in use in the early 20$^{th}$

century), but it is the only unit which contains flat glass. This is consistent with a level that could date to the 1850s/1860s.

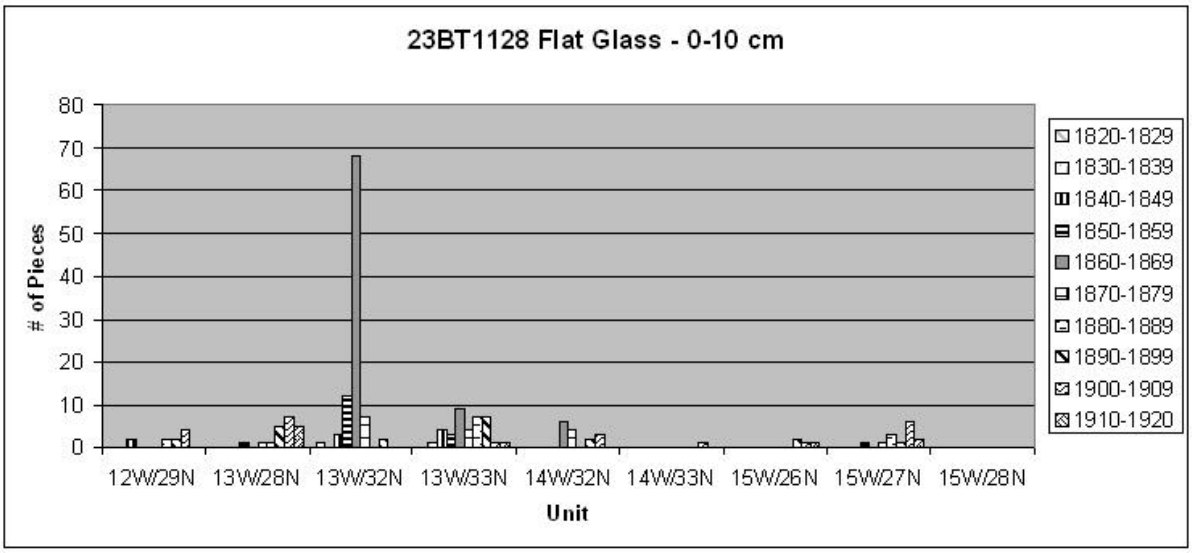


*Figure 5.2: Straub site Flat Glass – 0-10 cm*

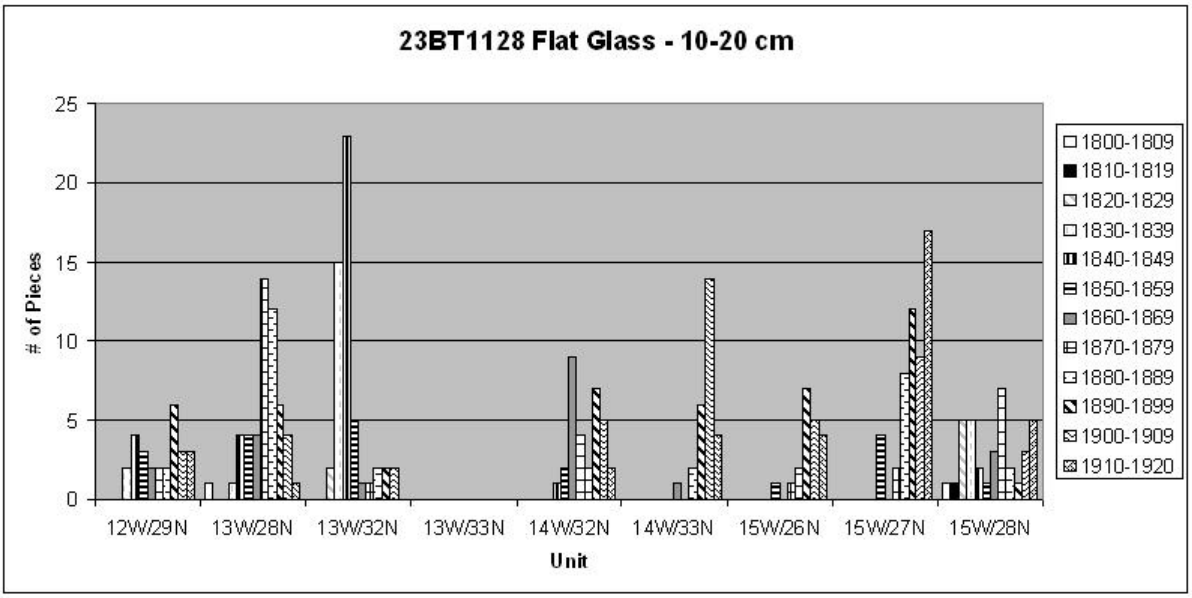


*Figure 5.3: Straub site Flat Glass – 10-20 cm*

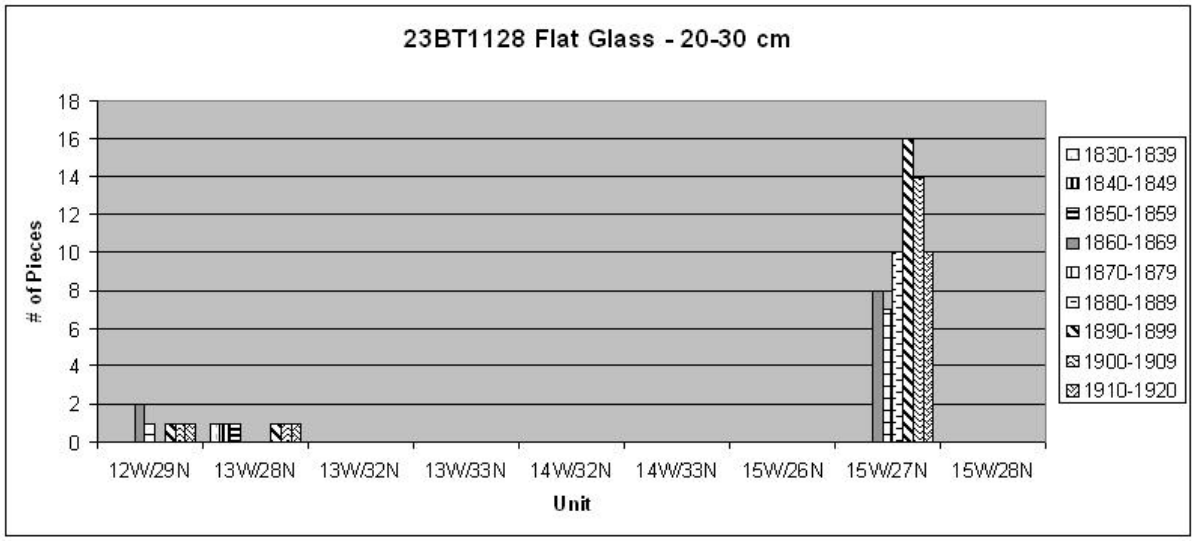


*Figure 5.4: Straub site Flat Glass – 20-30 cm*

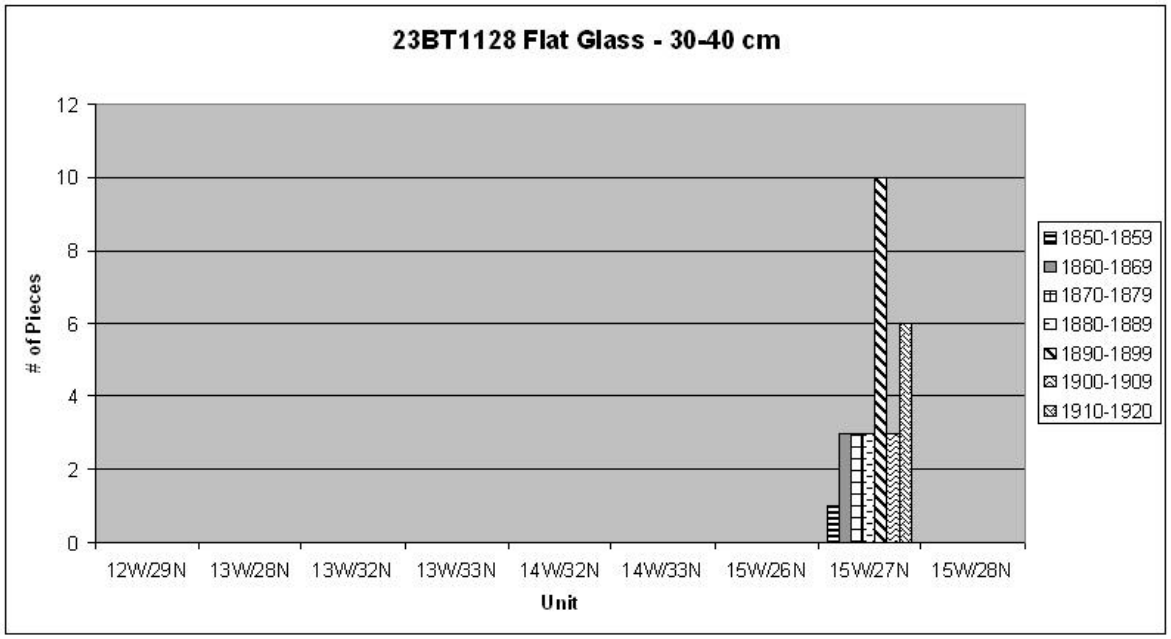


*Figure 5.5: Straub site Flat Glass – 30-40 cm*

The 20-30 cm level is similar in that the bulk of flat glass is found in the trash pit, and also in the "root cellar" unit (12W/29N). Again, a mixture of glass would be expected in such units. There is a small amount of flat glass found in unit 13W/28N, which has been identified as a possible window area (see Figure 5.6). The glass from this unit spans the period both before and after the war. However, the amount of flat glass in

this level at this unit is not significant. Also, given the fact that this foundation was used over a period of time, some mixing would occur along the foundation line during construction activities related to its re-use. While the number of pieces could not be considered statistically significant, the presence of earlier flat glass fragments in this unit is interesting to note as part of the overall chronological pattern, and the trend does still point to this level being potentially related to the Civil War period.

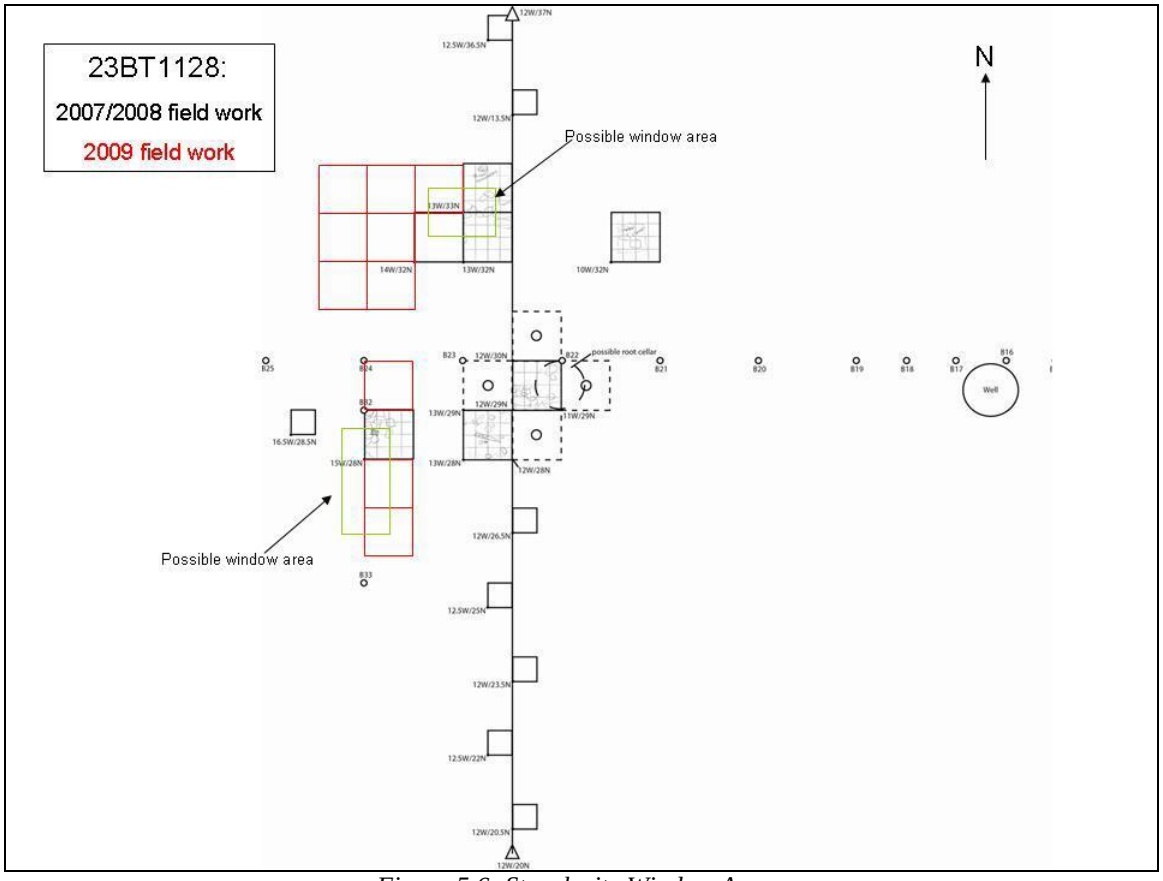


*Figure 5.6: Straub site Window Areas*

The next level, 10-20 cm, shows the most significant presence of flat glass. The "root cellar" and "trash pit" units continue to show a mixture of flat glass, as would be expected. However, the most statistically significant deposits of flat glass (in that they contain at least the minimum number of pieces identified as Moir as required for a viable

sample), occur in unit 13W/32N, and show a strong trend toward a pre-Civil War deposit. That being said, there is a reasonable amount of "background noise" flat glass throughout almost all of the units, which present both pre-Civil War and post-Civil War dates. This level, then, should be looked at for the possibility of representing the transition from Civil War era destruction to post-Civil War re-use.

The uppermost level, 0-10 cm, contains a mix of flat glass, with dates from the 1820s up to 1920, although only few units have enough pieces to be considered statistically viable. Still, with the exception of one unit (13W/32N), there is no strong pre-Civil War signature for the flat glass. Because this property has been used as a cow pasture for an extended period of time, it is quite likely that very fragile items such as flat glass have been destroyed, thereby skewing the sample. There is enough of a post-Civil War trend in the available flat glass to be consistent with a depositing dating to the latest extent of its occupation (late 19$^{th}$/early 20$^{th}$ century).

**Nails at the Straub Site**

Looking at the ratio of square nails to wire nails, one can shed more light on the chronology of the Straub site. Square (cut) nails tend to be one of the most pervasive time-sensitive metal artifacts found by archaeologists on structure-bearing 19$^{th}$ century archaeological sites, with square nails declining after the 1880s following the introduction of the types of wire nails used today (IMACS User's Guide, 2001:470.3). To complicate matters, use of square nails spanned most of the 19$^{th}$ century. Because of that, "nails dates" yield greater chronological precision when combined with other time-sensitive classes of artifacts, which is how they are used in this study.

An additional important consideration, when looking at nails for the purpose of chronology at this site, is that of preservation. The metal artifacts at this site were, in many cases, significantly deteriorated. In many cases, the amount of deterioration and flaking of both the nail shaft and nail head, made it difficult to determine conclusively whether a nail was square or wire. In cases where a nail was so deteriorated that a determination was not at all possible, it was excluded from the analysis. However, there are a large number of nails in the collection which have been counted as wire nails, which may have simply been deteriorated square nails. It is necessary to note, then, that wire nails may be over-represented in this analysis. With this in mind, and with the knowledge that nails are being used primarily as a supplementary data set, the overall trends are still useful and informative.

Based on the percentage of wire nails vs. square nails found at the site, the IMACS User's Guide has developed four date ranges to assist with creating chronologies: 1) 100% square nails = 1830-1886; 2) 50-99% square nails = 1887-1890; 3) 25-49% square nails = 1891-1895; and 4) 0-24% square nails = 1896 and later. Unfortunately, these date ranges do not break down into a fine-tuned scale, such as what is needed at these sites. However, as stated earlier, the overall trends are informative when overlain with other artifact types.

Since it is the ratio of square nails to wire nails that is the critical factor when using the IMACS protocol, the results for this artifact type have been graphed according to the number of excavation units in a given level that date to one of the four identified ranges (Figure 5.7). The values, then, reflect the number of units, and not the number of nails. The number of nails in a given sample is important to consider however, in

particular at this site when we are discussing the earliest date range (1830-1886). At the Straub site, the units/levels that fall into this earliest date range are represented by a very small sample of nails (in most cases only one or two nails, but in all cases no more than 4). This small sample could represent a case of sampling error, or it could be a reflection of the smaller number of nails used in early log home construction, such as would have been in use in the earlier phases of the site's occupation.

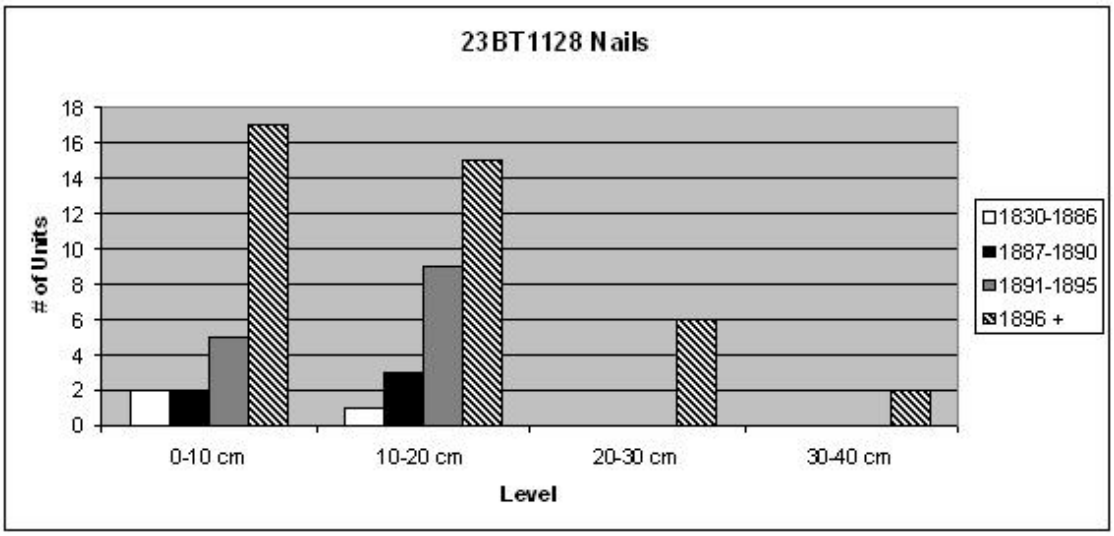


*Figure 5.7: Straub site Nails*

The important trend in this graph is the reduction in the number of units which fall into the 1896 and after date range. It is notable to point out as well, that in the 30-40 cm level, the only units which contained nails at all were 12W/29N and 15W/27N, the "root cellar" and "trash pit" units, respectively. In the 20-30 cm level, there are a total of six units which fall into this date range. However, four of those units contained 6 nails or less, which does not represent a statistically significant sample. The other two units, which contained 45 nails or more each, were again 12W/29N and 15W/27N.

Upon first glance, it would appear that some mixing of layers has occurred, based upon levels 0-10 cm and 10-20 cm containing units which date to the earlier date range,

whereas the lower levels do not. However, the earliest date range does not distinguish between occupations in 1830 and occupations in 1886. Therefore, those upper levels may very well represent post-Civil War layers, as far as dates from the nails can be interpreted. The overall trend, then, is a very strong one showing that the upper layers represent post-Civil War occupation, while the lower levels can very possibly represent Civil War or pre-Civil War occupation layers.

### Ceramics at the Straub Site

The most reliable chronological indicators for ceramics are maker's marks, although their presence at many archaeological sites can be sparse, as is the case with the Straub site, or even non-existent. While some patterns (such as Blue Willow) can be helpful in determining the date of ceramic material, the practice of copying popular ceramic and china patterns that was pervasive in the 19th and into the 20th and even 21st centuries makes this a difficult (if not impossible) endeavor. For instance, one can find new examples of the popular Blue Willow pattern in stores today, and the very popular "Tea Leaf" pattern was also heavily copied for decades (Bagdade & Bagdade, 1991; Kovel & Kovel, 1986, 1991; Lehner, 1988).

Also, it is important to note that a maker's mark does not provide a date for when the object was used, but simply when the object was manufactured. Some maker's marks were used within a tightly constrained period of time, whereas some are still in use today but still provide us with a beginning date of manufacture. When overlapped with other data, the few available maker's marks contribute to the overall trend.

A total of four identifiable maker's marks, and one identifiable pattern have been found at the Straub site. These four pieces were found in two different units at the site. Two pieces, each dating from 1890-1900, were found in the "trash pit" unit (15W/27N), one piece each from the 30-40 cm level, and the 20-30 cm level. Given that this is a known trash pit, their chronological utility is limited. The other two pieces come from 14W/32N, and are both from the 10-20 cm level. One of the pieces again dates from 1890-1900, while the other dates from 1872-1905.

The other piece that is useful chronologically is a piece of the popular "Tea Leaf" pattern. While this piece does not have a maker's mark visible, we do know that this pattern was made starting in 1856 (Bagdade & Bagdade, 1991). This piece was also found in the 10-20 cm level, in unit 15W/32N.

While not establishing a robust chronological pattern on its own, the maker's marks and identifiable patterns at this site serve to reinforce the chronological patterns that are already developing through an analysis of the flat glass and nails found at the site.

**Gun Parts at the Straub Site**

Gun parts and ammunition went through a significant amount of technological change in the period leading up to, and after, the Civil War (Hoyem, 1981; Lewis, B., 1960, 1972). Because of this, they can sometimes be indicative of date ranges of a decade or two, which contributes significantly to building a site chronology. At the Straub site, a total of eight pieces were identified with respect to manufacturer and a given time frame.

Two pieces of ammunition were found in the "root cellar" and "trash pit" units. Because of their mixed context, they are not useful in building a specific chronology. However, these cartridge cases were made by the Union Metallic Cartridge Company between 1867 and 1912. While they do not represent stratigraphically intact layers, that date range does echo the known date range of the overall occupation of the site. Of the remaining six pieces, three are ammunition, and the other three are all pieces of the same style and make of gun.

Of the remaining three pieces of ammunition, two of them were also from the Union Metallic Cartridge Company, dating from 1867 to 1912. One piece was found in the 20-30 cm level, while the other was found in the 10-20 cm level. The third piece of ammunition is a shotgun shell from the Peters Cartridge Company, dating from 1890 to 1934, which was also found in the 10-20 cm level. While the sample size is small, the bulk of the material is found in the 10-20 cm level, with dates that are in keeping with what we have seen with previous artifact types.

The three gun part pieces are all from a model 1851 Colt Navy Revolver, in use from 1851 until approximately 1870 (Hoyem, 1981; Lewis, B., 1960, 1972). The largest of these pieces is a gun "wedge" from this weapon (Figure 5.8). These pieces were all found in the 10-20 cm level, which could indicate either an earlier occupation date for that level or, more in keeping with other artifact types found at the site, a curated item from the Civil War.

*Figure 5.8: 1851 Colt Navy Revolver Gun Wedge (scale: 1 square = ¼ inch)*

**Glass at the Straub Site**

Aside from flat/window glass, other glass at historic sites can be useful in developing chronologies. Intact or mostly intact bottles, which have identifiable maker's marks, production scars, or product names, can provide helpful dates. Few of these date ranges for the material here can be narrowed down enough to pinpoint separate decades of manufacture and/or occupation of the site. But the earliest date of manufacture can provide additional helpful trends for the overall site chronology.

Many of these glass pieces can be assigned dates of manufacture using such attributes as shoulder seams, lip finishes, and suction scars, in addition to maker's marks. Some can be identified and assigned a date range based on the product and/or manufacturer's name. The most notable among these is a large piece of a panel bottle

front for “Dr. Kilmer’s Swamp Root” (Figure 5.9), which was manufactured starting in 1886, but can also still be found for sale today.

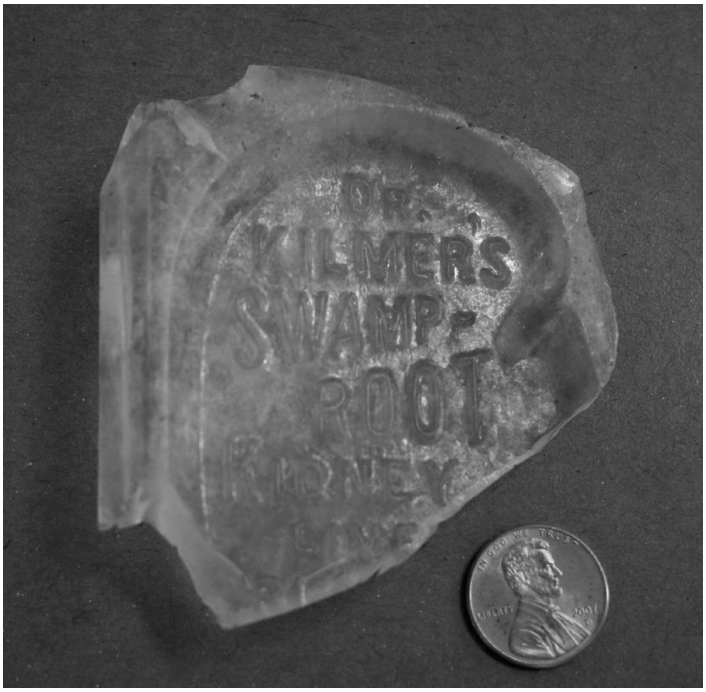


*Figure 5.9: Dr. Kilmer’s Swamp Root Bottle*

For the purposes of comparison and analysis, I have grouped the glassware with these types of identifiable features into decadal date ranges, based upon the earliest date of known manufacture, starting with 1870, and ending with 1920. These decade markers include dates during that entire decade (for instance, a bottle first made in 1873 would be included in the 1870 category). These are then organized by level across the site (Figure 5.10). Glassware found in the “root cellar” and “trash pit” units were excluded from this analysis. Additionally, the sample size for this particular analysis is small, and therefore more reliably indicative of a trend, as opposed to a strong pattern. As before, the lowest levels show very little of this post-Civil War glassware, and the 10-20 level shows the most robust deposit.

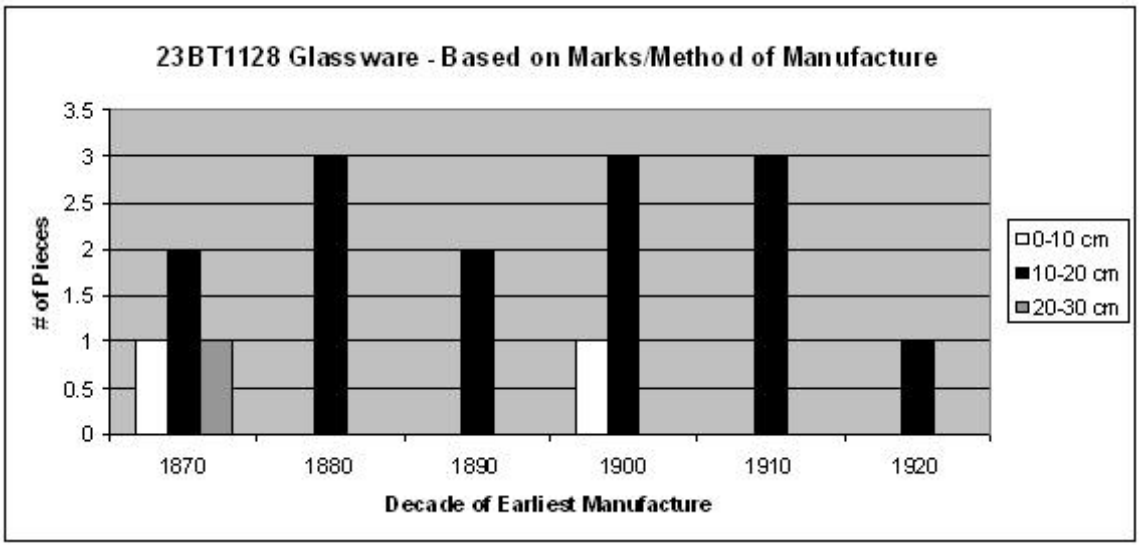


*Figure 5.10: Straub site Glassware – Based on Marks or Method of Manufacture*

Absent these features, the color of the glass can also assist with narrowing down dates of manufacture, and thereby occupation of the site. The Historic Glass Bottle Identification & Information Website (http://www.sha.org/bottle/index.htm), developed and run jointly by the United States Department of the Interior – Bureau of Land Management and the Society for Historical Archaeology, provides a wealth of information to assist with determining dates of manufacture for glassware. There are five glass colors that are most useful for dating purposes: Black glass, forest green, "milk" glass, olive glass, and "decolorized" glass (distinctive because of the use of manganese in its manufacture, which turns a purple hue over time when exposed to the elements). Site the Straub site contained no olive glass, but the other four types of glass were present.

Once again, these data were graphed according to level and date range (Figure 5.11) in order to identify trends in the chronology of the site. As before, data from the "root cellar" and "trash pit" units were excluded from the analysis.

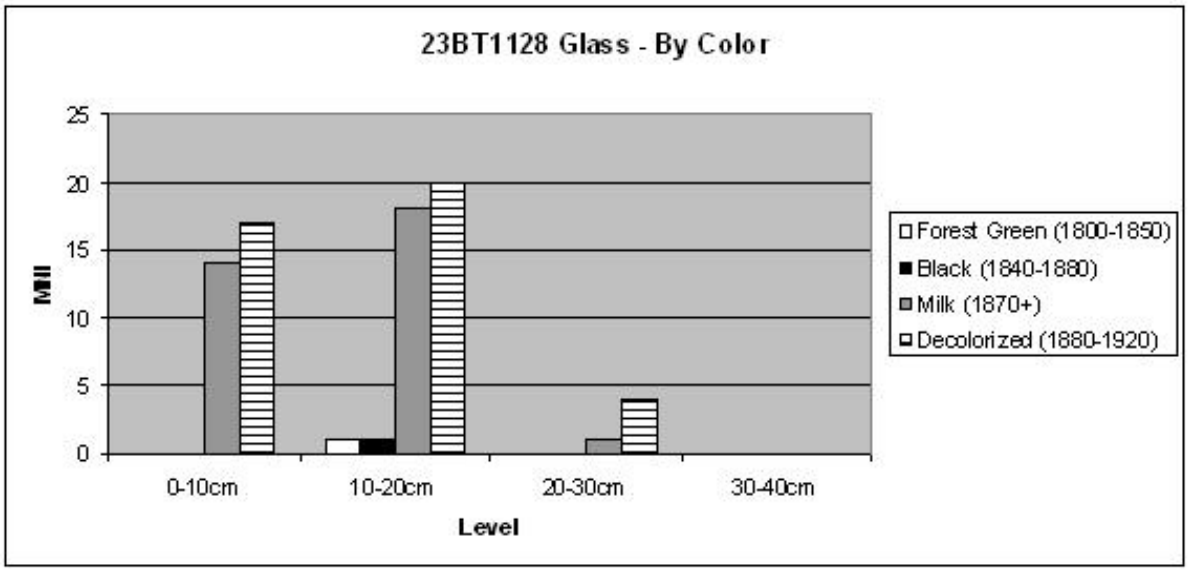


*Figure 5.11: Straub site Glassware – By Color*

These trends are consistent with what has been found with the other artifact types discussed so far. Glassware dating to the post-Civil War period is almost exclusively found in the 0-10 cm and 10-20 cm levels, while the lower levels have little, if any, glassware present. Indeed, the sample of glass from the pre-Civil War period is quite small, and is clearly dominated by the post-1870 assemblage.

**Faunal Remains at the Straub Site**

Faunal remains are not typically considered to be chronological markers at historic sites. However, the patterns present in faunal materials (Figure 5.12) at the Straub site are consistent with dietary patterns one would expect to see in an early frontier site, followed by a post-Civil War site, showing an increasing reliance on canned or purchased food items (Martin, 1942).

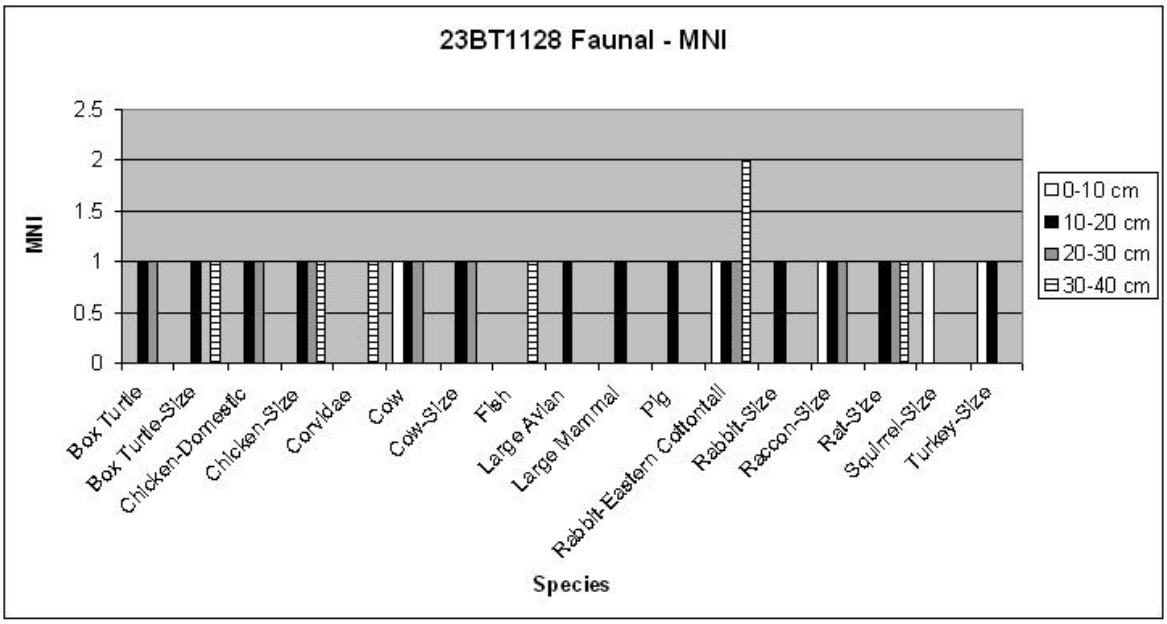


*Figure 5.12: Straub site Faunal Remains*

From the historical records, we know that the economy in Bates County prior to the Civil War was a subsistence economy based on hogs and corn typical of the upland south roots of many of the individuals who settled there (Gerlach, 1986; Neely, 2000). We also know that John Green, the patriarch of the family who lived on the Straub site, was noted for having cattle, a trait unique in the county at the time (Atkeson, 1918). Due to lack of refrigeration at the time of the Civil War, most meat was cured or pickled in some way for preservation, and fresh meat was obtained primarily through hunting (Martin, 1942).

While the sample size is small at this site with respect to the faunal remains, an interesting pattern appears when we examine the deposits level by level. In the lowest level, 30-40 cm, the deposit consists of turtle, chicken, corvidae, fish, rabbit, and a rat. As one moves up to the 20-30 cm level, there is still turtle, chicken rabbit and rat, but added to the assemblage are raccoon and cow. The 10-20 cm level, once again the most robust assemblage, also contains cow but adds pig, turkey, and other large avians/mammals. The

0-10 cm level consists only of cow, rabbit, squirrel and turkey. This could be representative of more modern pasture activities at the site, as well as modern hunting or scavenging activities.

While these patterns could be interpreted to represent an early hunting-based economy in the pre-Civil War period, followed by a more standard farming economy of the late 19th and early 20th century, it is important to note that this assemblage is quite small in size, and could also simply represent sampling error or activity areas not directly linked to food preparation or consumption, at least not for the entire occupation history of the site.

## The Limpus Site (23BT1129)

### Window Glass at the Limpus Site

Following the same procedures outlined for the Straub site, using the protocols set out in Weiland (2009), based on Moir's work (1977, 1987), I graphed the results of the date formulas graphed to include the units which contained (at least marginally) significant numbers of flat glass fragments. Whereas several units at the Straub site had enough flat glass to approach Moir's baseline of 15-20 pieces, none of the units at the Limpus site come close to approaching that threshold. In fact, the Limpus site is notable for having very little flat glass, compared to the Straub site. However, for purposes of comparison, and for implementing the model used at the Straub site for establishing chronological control, the flat glass fragments from two levels have been graphed.

While the deposits at the Limpus site are of similar depth to those at the Straub site, flat glass deposits were only found in levels 10-20 cm (Figure 5.13) and 20-30 cm

(Figure 5.14). Two individual pieces were found in the 0-10 cm level, one each in two separate units, and no flat glass was found below the 20-30 cm level.

Again, this overall pattern makes sense chronologically given the periods in question. As stated before, it is less likely that early frontier homes would have large amounts of window glass. We also know from historical accounts, that this was also the site of an early 19th century grocery, dating to the late 1830s and early 1840s. It would be expected, then, that the bulk of flat glass would appear in the levels dating after the Civil War. If, indeed, the 1830s grocery is represented by the units excavated at the Limpus site, very little flat glass would be expected at all. As with the Straub site, these "common sense" assumptions do still need to be fortified with the actual archaeological data.

What we do find at the Limpus site is very little flat glass, as compared to the Straub site. At the Straub site, there were over 1,000 pieces of flat glass in the sample. At the Straub site, there were only 110, and of those only 56 fall within the reliable date range of the formula (up to 1920). The bulk of that flat glass was found within the area of the stone floor (the possible 1830s grocery). Only four pieces are outside of this area, and they are all north and west of the structure. Additionally, none of the flat glass dates prior to 1850. This would indicate that, while the stone floor may have been originally associated with the 1830s grocery, it was likely re-used during the Civil War and/or post-Civil War eras.

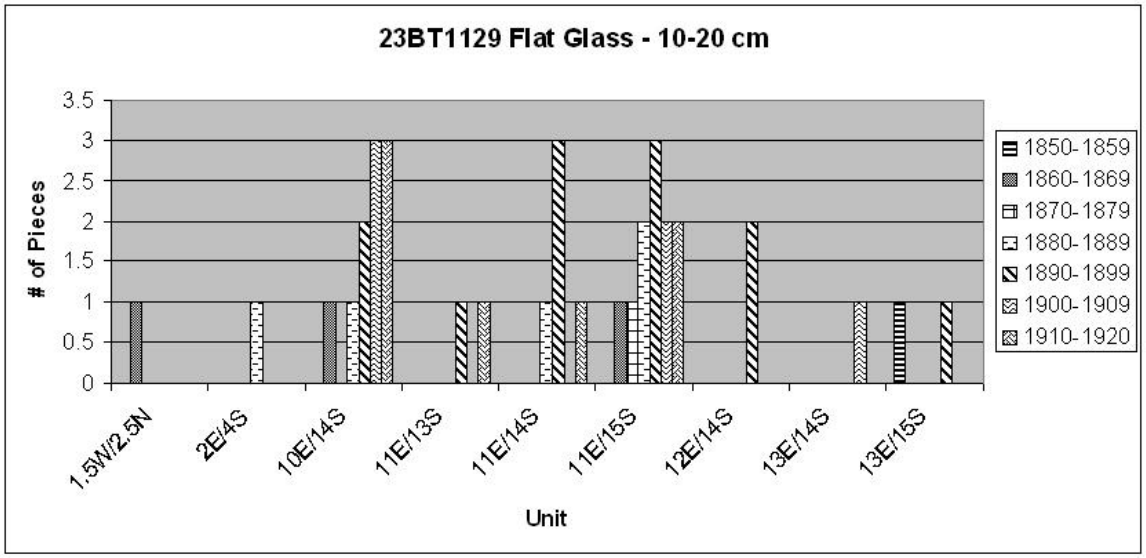


*Figure 5.13: Limpus site Flat Glass – 10-20 cm*

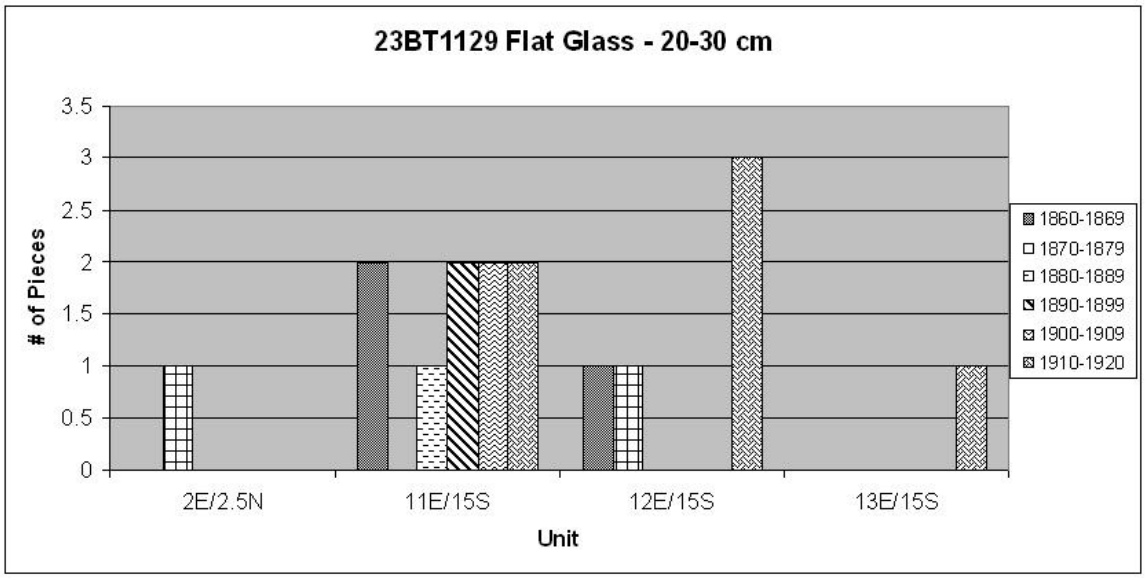


*Figure 5.14: Limpus site Flat Glass – 20-30 cm*

In both levels, the largest number of pieces in any given date range is no more than 3. As such, it cannot be considered a truly viable sample for dating purposes. However, the trends should still be taken into consideration when looking at the chronology of the site as a whole, and for comparison with other datasets. While there are

a few pieces of flat glass that date to the pre-Civil War and Civil War periods, the majority of the glass dates to the post-Civil War period. Keeping in mind the absence of flat glass in the lower levels, this could also indicate that no windows were present in the original structure (the grocery), and windows were only installed when the foundation/floor was re-used after the Civil War, possibly along the south side of the structure (Figure 5.15).

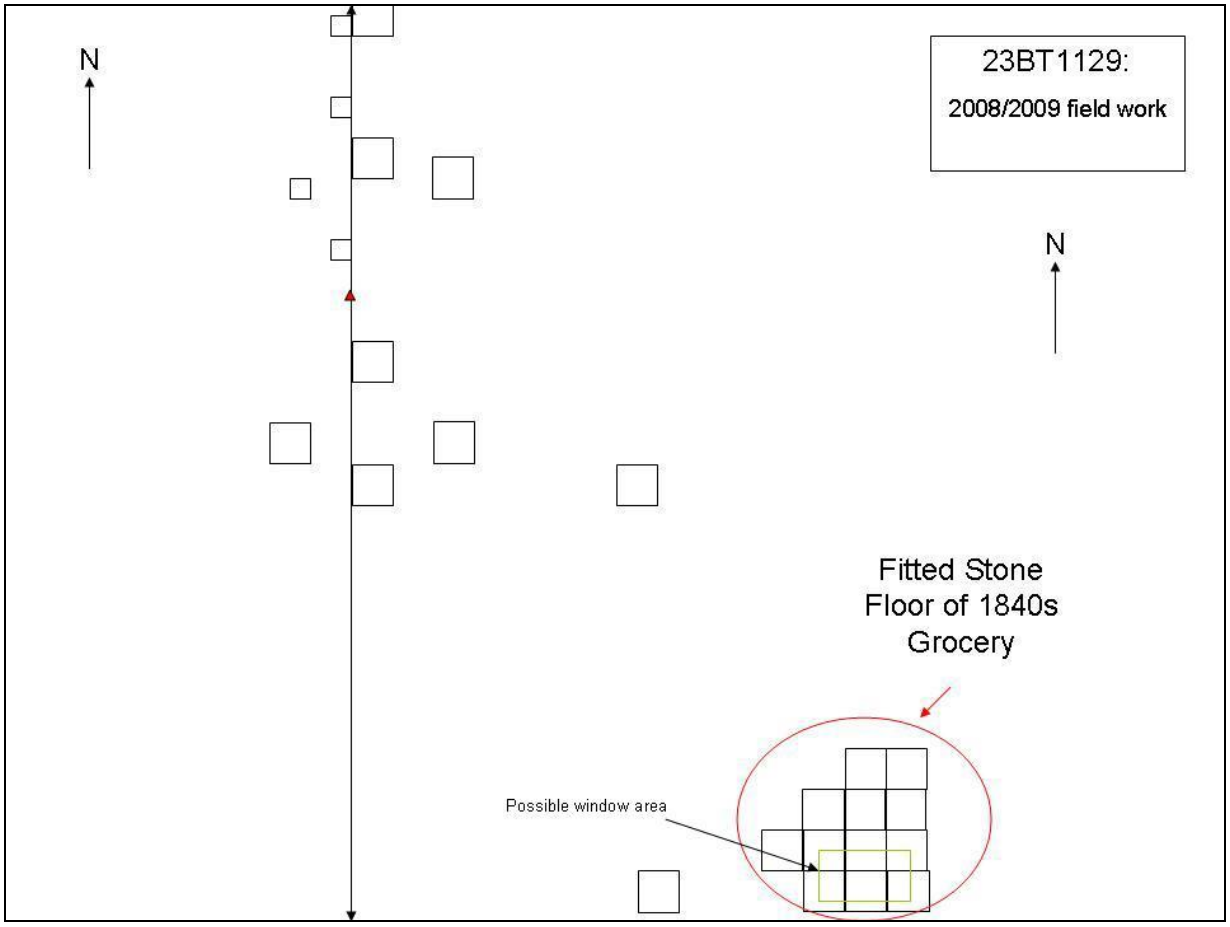


*Figure 5.15: Limpus site Window Areas*

**Nails at the Limpus Site**

As with the Straub site, the ratio of square nails to wire nails was analyzed, ((IMACS User's Guide, 2001:470.3), using those same protocols. Additionally, similar preservation issues were present at the Limpus site, possibly skewing the sample to have more wire nails than were truly present.

As a reminder, based on the percentage of wire nails vs. square nails found at the site, the IMACS User's Guide has developed four date ranges to assist with creating chronologies: 1) 100% square nails = 1830-1886; 2) 50-99% square nails = 1887-1890; 3) 25-49% square nails = 1891-1895; and 4) 0-24% square nails = 1896 and later. Unfortunately, these date ranges do not break down into a fine-tuned scale, such as what is needed at these sites. However, as stated earlier, the overall trends are informative when overlain with other artifact types.

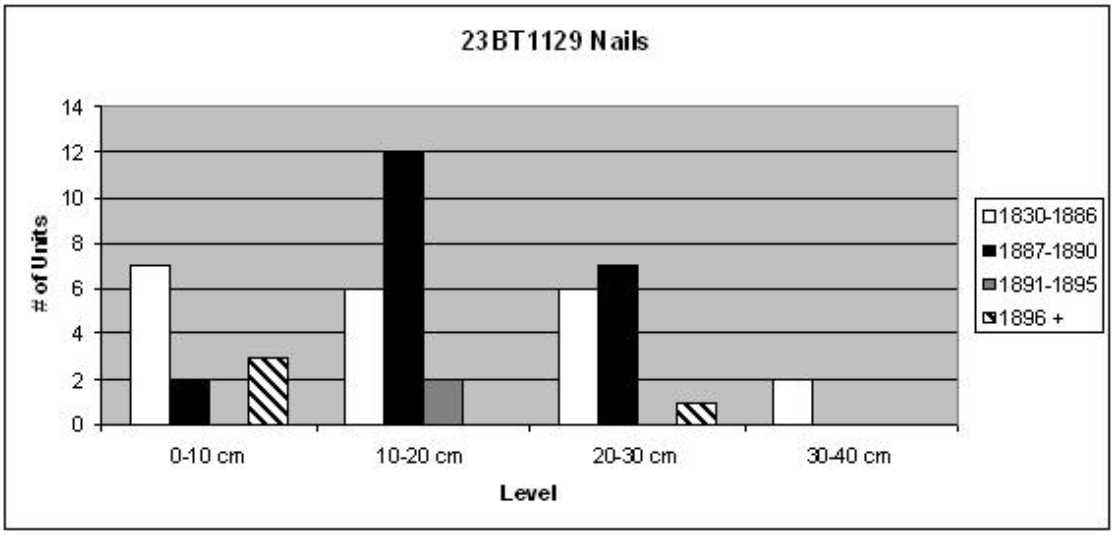


*Figure 5.16: Limpus site Nails*

Similar in pattern to the Straub site, the chronological pattern at the Limpus site (Figure 5.16) shows fewer nails of any age in the lowest level, with an increase in nail use through successive levels. It is interesting to note that all of the units which fall into the 1896+ date range based on nails, are outside of the area of the stone floor, several meters to the north. While the nails do not indicate a clear-cut chronological break between the levels, the trend is similar to that at the Straub site, with the majority of the more recent dates being in the upper levels and an increase overall nail use (as expected at early frontier sites) from the older lower to the more recent upper levels.

### Ceramics at the Limpus Site

Identifiable ceramic maker's marks are also present at the Limpus site, although in low numbers. A total of four were found at the site, and all of them were several meters north of the stone floor/grocery area. One mark dates to as early as 1851 (found in the 10-20 cm level), but that particular mark (for J& G Meakin) is still in use. A second mark dates to as early as 1873 (found in the 20-30 cm level), but is also still in use (Alfred Meakin). The other two marks date to between 1870 to 1882 (Charles Meakin, found in the 40-50 cm level using an auger), and 1871 to 1890 (Thomas Furnival & Sons, found in the 20-30 cm level) (Kovel & Kovel, 1986). The primary pattern that becomes apparent here, using maker's marks, is to show that these materials date primarily to the post-Civil War period as we move farther away from the stone floor/grocery area. This is a small sample, and it remains to be determined whether it is a reliable pattern, or the result of other site formation processes, such as construction activities or farming.

As stated earlier, while some patterns can be helpful in determining the date of ceramic material, the practice of copying popular ceramic and china patterns that was pervasive in the 19th and into the 20th and even 21st centuries makes this a difficult (if not impossible) endeavor. For instance, one can find new examples of the popular Blue Willow pattern in stores today, and the very popular "Tea Leaf" pattern was also heavily copied for decades. (Bagdade & Bagdade, 1991; Kovel & Kovel, 1986, 1991; Lehner, 1988).

One pattern that is found regularly at the Limpus site, but not at the Straub site, is the "featheredge" pattern. Unfortunately, for the purposes of chronology, this pattern was produced by several ceramics makers in the 18th and 19th centuries (Bagdade & Bagdade, 1991). Since this pattern is known to have existed much earlier than other patterns identified at either site, one implication can be that there are earlier deposits at the Limpus site than at the Straub site. Unfortunately, without a maker's mark, it is not possible to determine whether these materials date to the early, middle, or late 19th century. Also, the featheredge wares do appear throughout all levels of the site, in small amounts. The historical records show that there was an earlier presence at the Limpus site, with the grocery store, than at the Straub site, so the presence of these wares is a tantalizing indicator of this. However, without a maker's mark, no further conclusions can be drawn with respect to chronology.

A variety of transferware patterns are also present at this site, but were unable to be matched to a specific known pattern and/or manufacturer. The ever-popular "tea leaf" pattern is present at this site, and while it is still manufactured today, it is first known to appear in 1856 (Kovel & Kovel, 1986). There are a total of 5 vessels identified with this

pattern, 2 in the 20-30 cm level, and 3 in the 10-20 cm level. Again, without a maker's mark it is not possible to further refine the chronological analysis, but it is worth noting that all of the tea leaf materials were found in the area of the stone floor/grocery.

**Gun Parts at the Limpus Site**

Gun parts, ammunition, and other related items are also a useful artifact type for chronological analysis at the Limpus site. With the exception of one cartridge casing (Union Metallic Cartridge Company, 1867-1912, found in the 10-20 cm level, all the gun parts were found in the area of the stone floor/grocery.

The 20-30 cm level contained two cartridge casings, of unknown date, and a lithic core and fragment, of the type possibly used for gun flints. The 10-20 cm level contained three cartridge casings of unknown date, as a single lithic fragment, representing another possible gun flint. In addition, there were four other cartridge casings/shells that could be traced to a manufacturer and date of manufacture. Three of the cartridge casings are from the Union Metallic Cartridge Company, with a date range of 1867-1912. The other artifact is a shotgun shell base, from the Winchester Repeating Arms Company, with a beginning date of manufacture of 1866. The 0-10 cm level contained one cartridge casing from the Peters Cartridge Company, with a date range of 1860 to 1944. In addition, there is one lead bullet, .32 caliber, and a piece of lead in an undefined shape, but weighing 11.7 grams (more than twice the weight of the .32 caliber bullet).

While not a definitive pattern, the chronological trend with respect to gun parts is for the older material – in particular pre-Civil War gun flints – to be in the lower levels,

with the later ammunition in the upper levels. When compared with the other datasets available, it helps to shed additional light on the chronology at this site.

### Glass at the Limpus Site

At the Limpus site, no glass with identifiable maker's marks, production scars, or product names were found. Therefore, the only method of using glassware at this site for the purpose of chronology is to look—as described previously--at glass colors. No forest green glass was found at the Limpus site, but all four other types of glass were present.

For the purposes of comparison and analysis, as with the Straub site, I have grouped the glassware with these types of identifiable features into decadal date ranges, based upon the earliest date of known manufacture, starting with 1870, and ending with 1920. These decade markers include dates during that entire decade (for instance, a bottle first made in 1873 would be included in the 1870 category). These are then organized by level across the site (Figure 5.17).

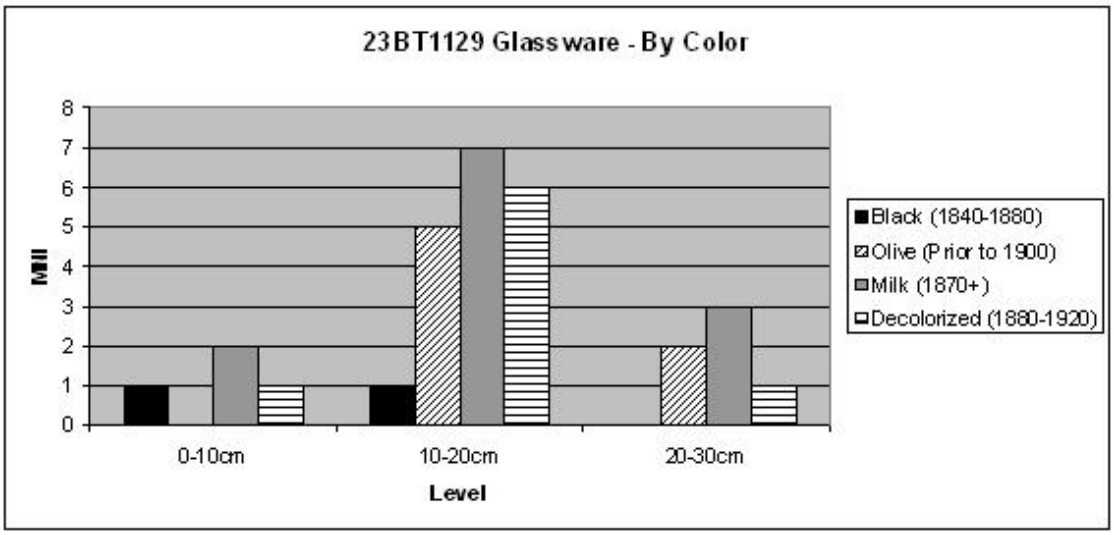


*Figure 5.17: Limpus site Glassware – By Color*

While these trends are not as clear as those found at the Straub site, they are still consistent with what has been found with the other artifact types discussed so far. Glassware dating to the post-Civil War period is found throughout the site, but is the dominant glass type in the 0-10 cm level. The 10-20 cm level contains the largest amount of glassware, and also contains samples from the pre-Civil War and post-Civil War eras. Much like at the Straub site, this level seems to be the transitional level for this periods. The material in the 20-30 cm level is almost entirely post-Civil War in age, but all the pieces from that assemblage, with the exception of one, come from the area several meters north of the stone floor/grocery.

**Faunal Remains at the Limpus Site**

The faunal remains at the Limpus site also add an interesting component to the chronological analysis of the site. As seen at the Straub site, the patterns that are present in the faunal materials (Figure 5.18) are interesting in that they are consistent with dietary patterns one would expect to see in an early frontier site, and then a later post-Civil War site, with a higher reliance on canned or purchased food items.

As indicated earlier, from the historical records, we know that the economy in Bates County, prior to the Civil War, was a subsistence economy based on hogs and corn. This is representative of the upland south roots of many of the individuals who came to settle in Bates County (Gerlach, 1986; Neely, 2000). We do not have any records which indicate that cattle may have been on the site, at least prior to the Civil War, but it would have been potentially available from their neighbors, the Green family.

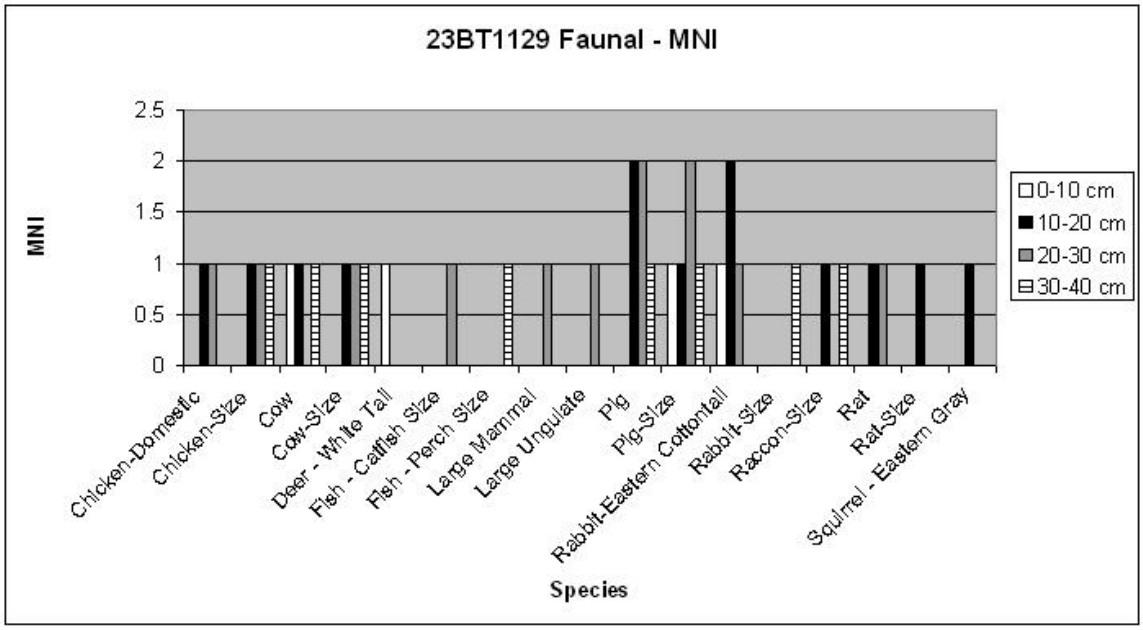


*Figure 5.18: Limpus site Faunal Remains*

While the faunal assemblage at the Limpus site is fairly limited, it is more robust than the the Straub site assemblage, not only in variety of species represented, but also in the MNI present. The assemblage in the 30-40 cm level consists of chicken, cow, perch, pig and rabbit, with a rat also represented. The assemblage in the 20-30 cm level consists of chicken, cow, catfish, a large mammal and a large ungulate, a rabbit, and a rat. Pig is also present, but in larger quantities, double that of the lowest level. The 10-20 cm level assemblage continues to have chicken, cow, pig, rabbit and rat, with the addition of squirrel as well. Pig remains the dominant species, while the variety overall has decreased. The 0-10 cm level consists only of deer, pig and rabbit.

The trends in the faunal assemblage, while not conclusive in their own right, do support an overall stratigraphic integrity at the site, in spite of some obvious mixing of materials. The remains are what one would expect as a site transitions from a frontier, hunting-based economy, to a subsistence economy during the Civil War and immediately

after, to a later 19th century economy where more food items are purchased from area markets. Additional research at the site will indicate whether this trend holds up across the site, or if it is partly due to a shift in activity areas across the site.

## Summary of Artifacts at the Straub and Limpus Sites

### The Straub Site (23BT1128)

Overall, the chronological trends at the Straub site are promising. First and foremost, the artifact types identified as critical for establishing chronology are all present. Additionally, based on the historical research done at the site, we know that the most intensive period of occupation (with respect to not only consistency, but also of family size) is in the post-Civil War period, up until around World War I. We also know that the earliest occupation of this site was brief, and followed by a period of heavy property destruction.

The trends for all artifact types, including faunal remains, reflect this history. The lower levels (30-40 cm and 20-30 cm) tend to not only have the earliest datable deposits, but also less volume of material in the assemblage. The upper levels (10-20 cm and 0-10 cm) have the later datable deposits, as well as the highest volume of material. The lower levels can comfortably be assigned to the pre-Civil War and Civil War periods, based on these findings. The upper levels can be assigned, for the most part, to the period of 1870 and after, but terminating at some point in the late 1920s or possibly early 1930s. The most intensive period of occupation was from the 1880s to the 1910s.

The 10-20 cm level is the most complicated level of the site to analyze, as there does seem to be a certain amount of overlap between the Civil War and post-Civil War

periods. This should be expected at sites such as these that are, in essense, a palimpsest. A site with a series of occupations, over several decades, within a shallow deposit, requires careful chronological examination and control, and these methods establish a model for this type of work.

When examining the common trends across all artifact types, it becomes clear that the site is relatively stratigraphically intact. There are two units with known mixing of deposits (12W/29N – the "root cellar," and 15W/27N – the "trash pit"), but the other units overall demonstrate that the site is, for the most part, undisturbed. This is encouraging since it is such a shallow deposit, but demonstrates how tenacious historical sites can be, particularly in highly rural environments such as this. The lack of intensive farming activities is a significant advantage in doing archaeology in Bates County and it is clear that sites such as these not only can survive, but do survive in good enough shape to allow detailed analysis.

**The Limpus Site (23BT1129)**

The chronology of this site is more challenging than that of the Straub site. There is a greater amount of site disturbance from post-depositional processes (including possible earth moving by heavy equipment) over portions of the site, so it is expected that there would be stratigraphic challenges. When employing the same approached used for the Straub site, the chronological trends at the Limpus site are clearer and provide a better platform for research and analysis.

Much like the assemblage at the Straub site, the artifact types identified as critical for establishing chronology are all present. Additionally, based on the historical research

done at the site, we know that there is an earlier component (1830s/1840s) than is present at the Straub site, but the most intensive period of occupation (with respect to not only consistency, but also of family size) is still in the post-Civil War period, up until around World War I. We also know that the earliest occupation of this site was also brief, and followed by a period of heavy property destruction.

The trends for all artifact types, including faunal remains, reflect this history. The lower levels (30-40 cm and 20-30 cm) tend to not only have the earliest datable deposits, but also less volume of material in the assemblage. The upper levels (10-20 cm and 0-10 cm) have the later datable deposits, as well as the highest volume of material. The lower levels can tentatively be assigned to the pre-Civil War and Civil War periods, based on these findings. The upper levels can be assigned, tentatively as well, to the period of 1870 and after, but terminating at some point in the late 1920s or possibly early 1930s. The most intensive period of occupation was from the 1870s to the 1910s.

The 10-20 cm level is once again the most complicated level of the site to analyze, as there is a moderate amount of overlap between the Civil War and post-Civil War periods. Another palimpsest, this site was a series of occupations, over several decades, within a shallow deposit. As such, it requires careful chronological examination and control, and these methods provide another successful test of this as a model for this type of work.

When examining the common trends across all artifact types, it becomes clear that the site is moderately stratigraphically intact, with the largest amount of mixing occurring in the areas outside of the stone floor/grocery area. This is encouraging since it demonstrates that this method, even at sites where some post-depositional disturbance has

occurred, can provide a significant amount of chronological clarity that might otherwise go undetected.

### *Socioeconomic Indicators*

Having established a workable model for chronological control at both sides, it is now possible to turn attention to analyzing socioeconomic responses to the demands present in each of the identified periods. There are a variety of ways to analyze the archaeological data along the lines of social and economic status. One approach is to look at individual artifact types (such as ceramics, or luxury goods) and assign class or economic values to each, thereby establishing a social or economic baseline for the household represented by the assemblage. This idiosyncratic approach can be extremely useful in many circumstances. However, in this instance, the goal is to look at much broader trends of socio-economic response to chronic warfare, so an approach that emphasizes these patterns and trends is more suited to this analysis.

## **Pattern Recognition**

Pattern recognition is a critical component of archaeology, and no less so in historical archaeology. Stanley South, in his landmark work *Method and Theory in Historical Archaeology* (1977), advocates strongly for the use of quantitative analysis in studying past cultural systems. A variety of pattern types have been established in past work, for the purpose of such analysis. These pattern types include the Piedmont Refuse Disposal Pattern (Drucker, et al. 1982), the Tenant Artifact Pattern (Trinkley and Caballero, 1983), and an Upper South Pattern (O'Brien et al., 1982), just to name a few.

In the Richland Creek project, Randy Moir (1987d) echoes this work in his analysis of late 19th and early 20th century farmsteads in Texas, and historical archaeologists in the latter part of the 20th century, and now going into the 21st century continue to use this as an important analytical tool.

Simply having a pattern is not sufficient. It is necessary to determine which patterns are valid, and show meaningful trends which answer the questions being asked (Resnick, 1988). My primary hypothesis, that a pattern of economic response to long-term chronic warfare on the Kansas-Missouri border can be defined and differentiated from economic patterns during the later period of recovery and reconstruction, essentially engages three levels of patterns which intersect to contribute to the interpretation of these sites.

The first major pattern is at the national level. That is, how were people living during these periods in question, namely, before and then after the Civil War? A variety of resources are helpful in looking at these national trends, in particular rates of manufacturing and consumption. In 1860, manufactured goods made up a relatively small percentage of items used day to day by families and individuals (Martin, 1942). There was no refrigeration in most households, and the majority of families subsisted on a small array of staple foods – cured meats (primarily pork), corn, peas, beans, onions, cabbage and dried or canned fruits – most of which were easy to store for long periods of time in a root cellar, or buried in the ground (Martin, 1942). In the years after the war, particularly by the 1880s when railroads criss-crossed the country, the rate of manufactured goods not only increased, but increased exponentially (Moir, 1987d). The rate of consumption of

manufactured goods rose sharply across the country as more and more goods – at more affordable prices – became widely available.

The second major pattern is at the local level. While it is informative to know in general terms the standard of living across the nation, the practical expression of that would be quite different in New York City versus West Point, Missouri. It is critical, then, to understand that within the context of these larger national patterns, the western border of Missouri was still a frontier in the 1850s and 1860s. In such an environment, many of the outward distinctions between social classes were minimized, or altogether eliminated, including differences in dress, diet, and in many ways, architecture (Martin, 1942). After the Civil War, and into the beginning of the 20th century, it became possible once again to accumulate material expressions of class and wealth, as people moved back into the County, and railroads were finally established and running through the area. However, even though major cities like Kansas City grew as did other larges cities in the country, Bates County remained predominantly rural. The mining boom brought a period of successful industry and relatively high population, but it was localized in the southeastern mining regions of the county. Once that boom went bust, an agricultural lifestyle predominated and has continued to do so into present day.

The third pattern, then, is at the individual or household level. Given the national patterns and the local constraints (or lack thereof), individual response to those pressures and opportunities help us to tell the story of their impact. Did the people of Bates County respond to the consumption opportunities of the late 19th and early 20th century the same way that their neighbors did, whether in the same County, or in a different part of the

state, or in another part of the country altogether? What patterns will help us to begin unraveling this question?

This study is only the very beginning of a process to establish a model of social and economic response to the grueling chronic warfare which took such a terrible toll on the County. Much work will still need to be done to find a complete answer, but there are a few key trends in the archaeological record that can help us to build a foundation for such a model. Stanley South proposed the Carolina and Frontier Artifact Patterns (1977) as a way of comparing behavioral differences in the archaeological record, and their utility has been proven in subsequent archaeological studies (i.e., Resnick, 1988).

People daily must make choices about where to expend resources, and their decisions about where they spend those resources – for items related to survival, or for more discretionary or luxury items – helps to paint a picture of their day to day life and its constraints. These patterns look at a percentage relationship between artifact groups, specifically those which are related to kitchen behaviors, and those which are related to architectural or structural behaviors. These artifact groups directly link to items people choose to purchase or make and use, based on their needs and level of income. Everyone must have a place to live, and everyone must eat. At the same time, there are a variety of choices when it comes to style of home and its level of luxury, and the same can be said for the dishes upon which people eat, the types of food they purchase (if any), and how it is cooked and stored. These ubiquitous and varied groups of material remains create a perfect platform upon which to build a model.

The Frontier Pattern shows a much higher percentage of structural artifacts relative to kitchen artifacts (by a ratio of 2:1). In a frontier environment, as stated earlier,

the principal demands upon the household are of establishing a warm, dry house and maintaining a consistent food supply. Material differentiation between classes is low, and the demands for housing are paramount. This pattern also can represent areas inside ruins. The Carolina pattern characterizes a domestic occupation, and shows a higher percentage of kitchen artifacts and a lower percentage of structural artifacts (again, a ratio of 2:1). This would be expected in an established household where the individuals could move beyond day-to-day concern about the structure itself, and where the environment allows more material expression of social class distinction (Resnick, 1988). Using these patterns as our model, we can begin to look at the major trends present in the archaeological record at the Straub and Limpus sites in order to create a baseline for initial interpretation of these sites, and for future research in the County. Additional discussion of these patterns, including their utility and potential shortcomings, is discussed in Chapter VI: Conclusions. First, we shall examine the trends that are present in the archaeological record.

## Significant Trends in the Archaeological Record

Using the Carolina and Frontier patterns as a model, it is possible to look at the patterns at each site with respect to the percentage of kitchen artifacts versus structural artifacts. Following the protocols set forth by Stanley South (1977), the kitchen group of artifacts consists of items such as ceramics, beverage bottles, glassware (other than that identified as medicine bottles, toiletries or other non-kitchen personal items), tableware and other kitchenware (pots, pans, kettles, etc.). The structural group of artifacts consists

of window glass, nails and other fasteners, construction hardware and materials such as daub, brick or chinking, and door lock parts. The unit of measure is MNI.

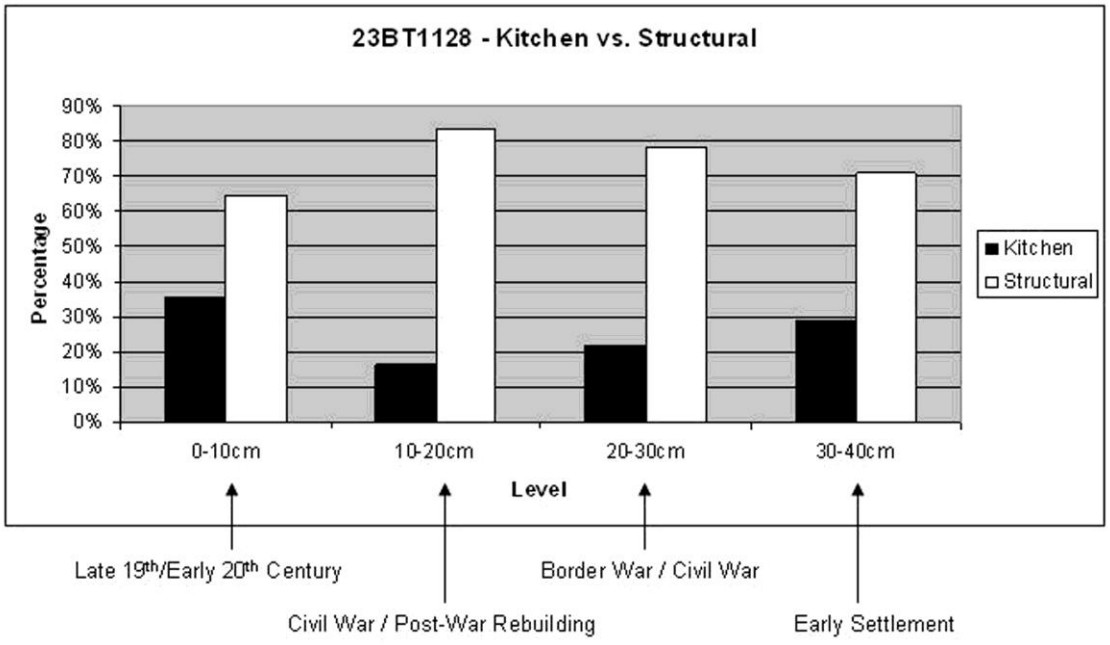


*Figure 5.19: Straub site Kitchen artifact group versus Structural artifact group*

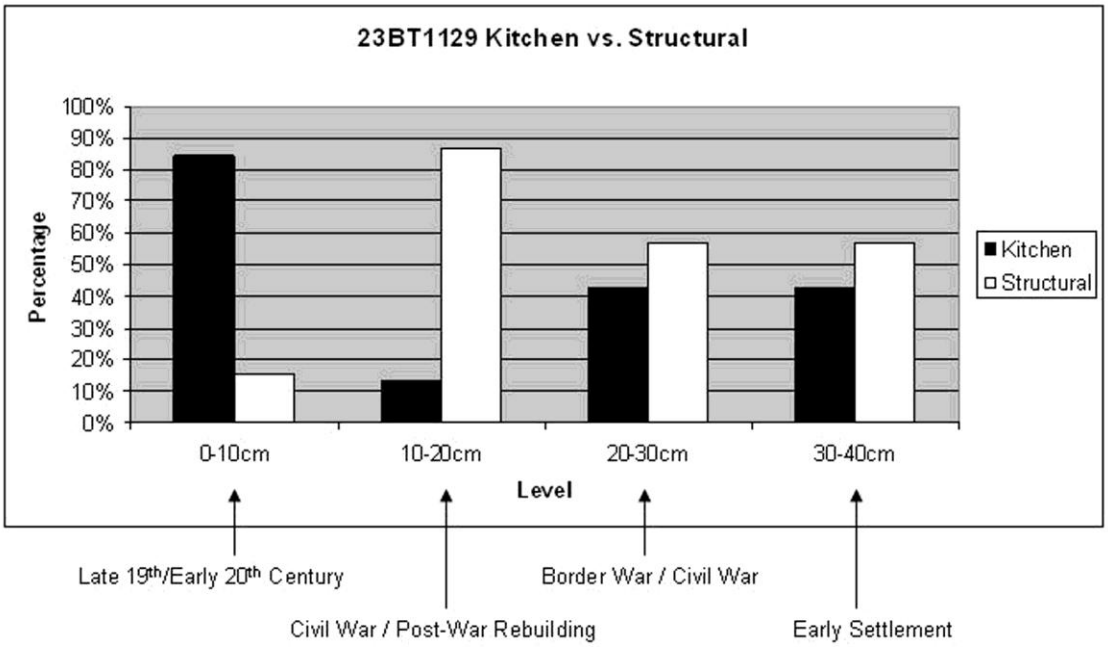


*Figure 5.20: Limpus site Kitchen artifact group vs. Structural artifact group*

The first series of charts shows the percentage of kitchen artifacts to domestic artifacts of each level at the Straub site (Figure 5.19) and the Limpus site (Figure 5.20). The second series of charts shows the same data, using a line graph to more clearly demonstrate the trends in the relationships of these two artifact groups at the Straub site (Figure 5.21) and site the Limpus site (Figure 5.22).

While many studies, including Resnick's analysis of a South Carolina farmstead (1988) use these patterns to establish site chronologies, there is a broader application for them. Using my model, based on the work of Stanley South (1977) and others mentioned earlier, a chronology can be established independent of these patterns. A more compelling use of these patterns is to use them to look at trends in behavior across time and, eventually, over space. It is tempting to think of the patterns as reflecting a specific moment in time, or space because of their names. It is more informative to look at them in terms of behavior and response to stresses in the environment.

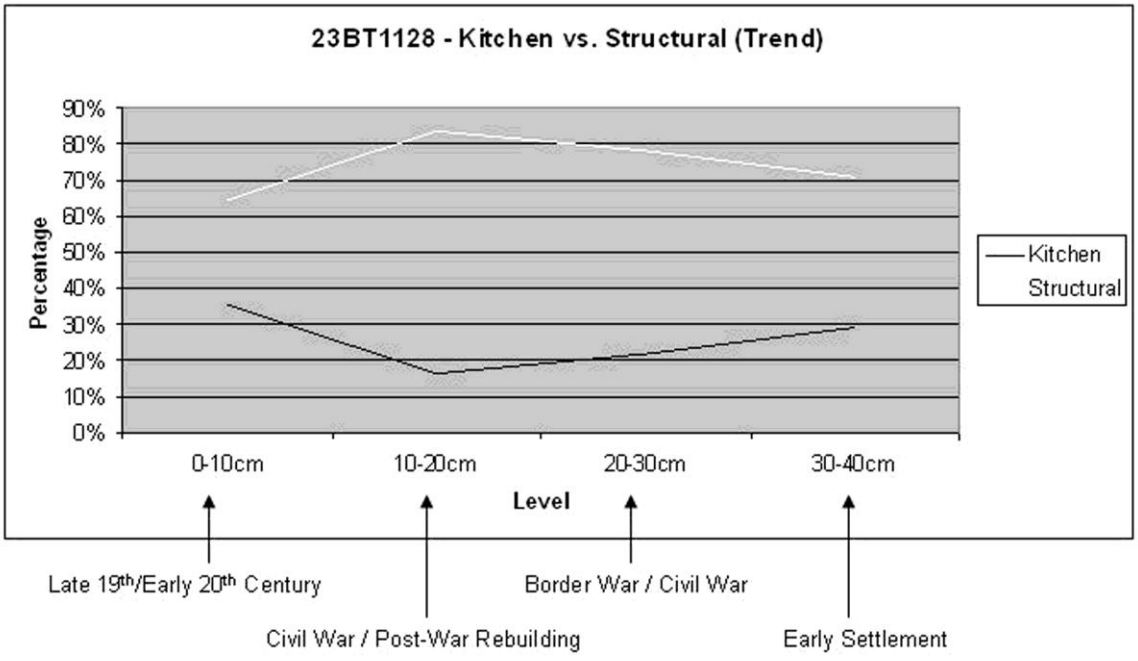


*Figure 5.21: Straub site Kitchen vs. Structural (Trend)*

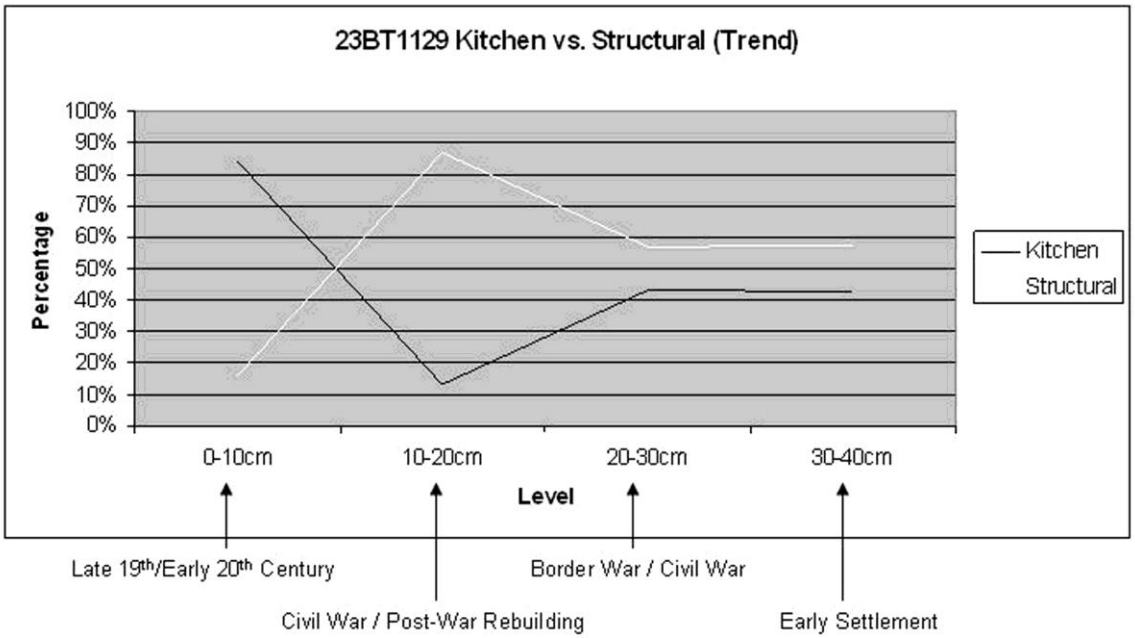


*Figure 5.22: Limpus site Kitchen vs. Structural (Trend)*

First, let us look at each site individually, and then compare them to further discuss the related trends and patterns. The Straub site expresses the Frontier Pattern across all levels of occupation. This means that the percentage of architectural artifacts is significantly higher in each level than the percentage of kitchen artifacts. We know, of course, that chronologically speaking, this site would not be considered a "frontier" site for the entirety of its occupation. Indeed, occupation of this site goes into the early 20th century, long after the American frontier had faded into relative obscurity. It is important, then, to look at the Frontier Pattern not as representative of a fixed time, but of a pattern of behavior where individuals must respond to scarcity in their environment and make resource distribution choices accordingly.

Within levels 30-40 cm and 20-30 cm, it would be expected that the Frontier Pattern is expressed. Bates County at this time, particularly in the lowest levels of the site, was a frontier. Resources were scarce, expressions of material differences in social

class were minimized or eliminated, and the primary focus was on building up the infrastructure and maintaining a basic level of subsistence. During the course of the Civil War itself, these pressures would have not only remained in place, but were likely heightened. We see this represented in the 20-30 cm level as the kitchen artifact group decreases from even the earlier frontier period.

The 10-20 cm level sees an even larger percentage of structural artifacts than either of the previous two periods, and the kitchen artifact group declines even further. Knowing the history of the site and the area, this would also be expected once the war had ended, and individuals moved back into a decimated landscape which required extensive rebuilding. It is worth noting here as well, that these behavioral trends also echo the chronological/stratigraphic trends discussed in the Chronology section earlier in this chapter. It is also interesting to note, that this decline in the kitchen artifact group comes at a time, after the Civil War had ended, when manufacturing was nationally on the rise. While it is understandable that the emphasis in Bates County would have been on rebuilding, it does indicate a trend that individuals in the County were not only allocating a majority of resources to structural needs and concerns, but they were doing so at the expense of other consumer items.

Once rebuilding had taken place, and keeping in mind the exponential rise in manufacturing that was going on in the rest of the nation, the expected trend in the 0-10 cm level would be a switch from the Frontier Pattern to the Carolina Pattern. This is not the case. While there is a decrease in the percentage of structural artifacts, and an increase in kitchen artifacts, structural artifacts still dominate the assemblage. The Carolina pattern typically is expressed by a 2:1 ratio of kitchen artifacts to structural

(Resnick, 1988), but that is most definitely not the case at this site. Knowing that the Straub site is, overall, stratigraphically intact, these trends create the beginnings of a powerful model for examining socio-economic response to cultural and environment stresses, in particular the chronic warfare of the Border War and Civil War period, and the period of rebuilding afterward. This model will be discussed in further detail at the end of this chapter, the ramifications of which will be explored in Chapter VI: Conclusions.

The pattern that is expressed at the Limpus site is slightly different, and poses some other interesting research questions and approaches, although it still contributes to the overall pattern seen at the Straub site. As with 23BT118, there is a higher percentage of structural artifacts, relative to kitchen artifacts, but the difference between the two groups is slight. This could very well be explained by the use of the Limpus site during the early periods of its occupation, specifically its use as a grocery store. This would still entail a significant focus on structural resources in a frontier environment, but the higher percentage of kitchen items would explained by having a stock of items for sale, as opposed to what would be used by a single family for their own purposes.

With the 10-20 cm level, we see almost same pattern that is expressed at the Straub site, which again would coincide with a period of post-war rebuilding in the County. Alternatively, since we know from historical records that in the period leading up to the war, this site switched use from a grocery store to a farmstead owned by the Clark family, this pattern in the 10-20 cm level could reflect the abandonment of the area represented by the stone floor (which makes up a significant area of the excavated portion of the site), or its re-use as a non-domestic space.

The pattern expressed in the 0-10 cm level is the most striking difference between the two sites. In this instance, the Carolina pattern is strongly expressed. The simplest explanation for this difference would be to say that there must have been strong economic differences between the two families and that these patterns simply express individual household idiosyncrasies. However, there is at least one key factor to consider at the Limpus site that makes this simple explanation inadequate. The primary consideration is the switch in site use that happened over the course of its occupation in the 19th and 20th centuries. The stone floor appears to be associated with the early- to mi-19th century grocery at the site. This is supported by historical documents, including surveyor's maps and notes that indicate a fairly precise location for the grocery. The excavation at the Straub site focused primarily on the area of this stone floor, and weather considerations (particularly during the 2008 field season) prevented further excavation in other areas at the site. Therefore, the site of the Clark farmstead has not been identified. Historical documents show that not only did the Clark family live at the site during the time of the Civil War, but afterwards into the early 20th century. There is also a second well on the property to the north and east of the stone floor area, which could be associated with the later Clark farmstead. This apparent switch to the Carolina pattern, then, may not reflect individual economic differences between the families at the Straub site and the Limpus site, but could reflect differences in site use over time as well as sampling bias due to the extent of the excavation at the Limpus site.

## Additional Considerations

The broader patterns, such as those discussed above, provide the most meaningful method for comparison with larger local and national trends. That being said, there are other considerations, unique to each context, which provide additional context and validation for the trends at each site. For instance, if a site has changed hands over the course of its occupation, so that individuals who are not related, or who have a different state or country of origin have established separate homesteads, this could create difficulties with interpreting trends over time. These discrepancies would possibly need to be accounted for as much as possible, particularly if the different family groups came from significantly different economic or ethnic backgrounds.

In the case of the Straub site, it is known from historical records that the site was occupied by members of the same family for the entire period in question. While it is not possible to account for all minor differences in economic status through time, this provides a consistency of occupation that aids in the interpretation of the site. As mentioned previously, the occupation history of the Limpus site is not as straightforward, although the Clark family did remain on the property from the time of the Civil War, up through the early 20$^{th}$ century. So while the early 19$^{th}$ century component is linked to a different family, and also a different use as a commercial establishment, there is a similar consistency of occupation through the late 19$^{th}$ and early 20$^{th}$ century, like that seen at the Straub site. Again, this is helpful when interpreting long-term trends at the site.

There are other artifact groups that could be examined to augment the socio-economic trends at each site. Common artifact types to examine include ceramics (for instance, the presence of fine china as compared to other more "common" goods) or

glassware (decorated or fancy wares vs. utilitarian), or the presence of fancy serving pieces, such as fine silver. Given the lack of clearly identifiable artifacts in any of these categories at both sites, this type of analysis would not be productive. There are a few other artifact types that, although represented by only a few examples, provide additional context that enhances the picture created by the larger pattern described earlier. These items include gun parts, luxury items, and medicines.

### Gun Parts

When thinking of 19th century farmsteads, it is typical to think of hunting and defensive weapons as the primary weapon at these types of sites. Indeed, the majority of gun-related artifacts at both of these sites are .22 and .32 caliber cartridge casings, and a small sample of .12 gauge shotgun shell bases. This would be expected at a time when hunting and, perhaps secondarily home defense, were expected activities. (All gun parts, at both sites, are found within the 10-20 cm level, which is thought to be associated with the Civil War era and post-Civil War rebuilding).

There is an interesting deviation from this pattern at the Straub site. At this site, also in the 10-20 cm level, are three parts that all go to an 1851 Colt Navy Revolver. This is a specialty weapon, favored by individuals such as Quantrill's Raiders (Fellman, 1989; Gilmore, 2006; Goodrich, 1995). This weapon, in use only until about 1873, was indicative of a very specific type of warfare – guerrilla warfare – that predominated in Bates County during the 1850s and 1860s. The presence of this weapon in the assemblage points to an interesting choice in resource allocation. Either John Green, or a member of his family, was a guerrilla or closely associated with guerrillas, or they at least

saw enough of a justification to purchase an offensive weapon of the sort to have on hand in case it was needed. Eventually, the weapon went out of use and was disposed of at the site. While this does not speak specifically to a certain level of economic status, it does demonstrate the stresses at play in this area that emphasized economic choices geared toward survival, as opposed to comfort.

### Luxury Items

Knowing the history of these sites, it is logical to think that luxury items would not appear in any significant amount, if at all, in the earliest occupation levels. Luxury items, generally speaking, would include those items not immediately necessary for subsistence, and maintaining the homestead. This could include fine jewelry, cosmetic items, musical instruments or other forms of entertainment. It could also include items associated with tobacco use or children's toys. Again, while the mere presence of a few luxury items would not provide detailed information about the owners' economic status, it does again shed additional light on how they chose to allocate resources during times of stress.

Since these were initially early frontier sites, luxury items would have been hard to come by, and the ones that did exist would have had to survive the overland trip from the family's point of origin. In this instance, luxury items would likely have been curated items. They were probably not ones obtained directly at the site of the new farmstead. Also, when the family was faced with the need to evacuate on short notice during General Order No. 11, it is likely that they would have been packed up any luxury items in the household and taken those with them when they left. Indeed, no items which would be

classified as “luxury” items are found in the assemblage at either site in the 30-40 cm level. In the 20-30 cm level, there is one gold locket and one glass bead at the Limpus site, and two glass beads and a clay pipe stem at the Straub site.

In the 10-20 cm level, at the Limpus site, there is a single heart-shaped silver locket, and two pipe stems. In the same level at the Straub site, there is a single pipe bowl and four glass beads. Even though at this point the war is over, this would hardly account for a robust “luxury” artifact signature, and this period also coincides with the point in the Frontier Pattern when the largest amount of resources seem to be focused on structural needs as part of the post-Civil War rebuilding.

There is one difference that appears in the 10-20 cm level at the Straub site, and that is the presence of a concertina reed (similar ones have been dated to the period from 1870-1890, which again coincides with the previously determined chronology of the site). There is additional evidence of musical instruments at the Straub site, but unfortunately they appear in the “root cellar” unit (12W/29N) and the “trash pit” unit (15W/27N), making it difficult to associate the items with a specific level. However, these artifacts include five more concertina reeds, like the one found in situ in the 10-20 cm level, and the name plate from a phonograph from the Universal Phonograph Company in Chicago, Illinois (dating to no earlier than 1899). These items can definitely be associated with the post-Civil War deposit. They indicate that the family at the Straub site was musically inclined and, in spite of the economic stresses they faced, considered these items were important enough to possess. One caveat to consider in the interpretation of these items is the fact that it is impossible to know whether the family purchased them or received them as gifts. We know from the historical record that Sarah

Green occupied the site after the death of her father and during the course of her subsequent marriages. It is possible that these items came from the family of one of her husbands and were not purchased.

The 0-10 cm level at the Limpus site contains no items that would be considered luxury items. As mentioned previously, however, this could be due to a shift in activity areas away from the stone floor to another part of the site that has yet to be excavated. The same level at the Straub site contains only two glass beads in the luxury category.

Interestingly, no bottles could be specifically associated with alcohol consumption at either site, although the nature of the glass assemblage is such that no whole bottles remain, and the overwhelming majority of the glass is in small pieces and impossible to associate with specific contents. The consumption of alcohol could have occurred at a different site, but as mentioned above, most of the glass fragments were so small that they could not reliably be associated with contents, and therefore could reflect alcohol consumption but no diagnostic pieces indicate this. Additionally, the only children's toys that were found were three clay marbles (two in the 10-20 cm level, and one in the 0-10 cm level) at the Straub site. These items would not be considered luxury items. A single porcelain doll's head was also found at the Straub site, but it was a surface find and therefore lacking adequate context for temporal association. Overall, while a few luxury items could indeed be identified, the lack of them at both sites, across all periods, is also consistent with the Frontier Pattern that predominates across time and space.

**Medicine**

Before and during the Civil War, patent medicines were not as widely available as they were after the war. This is due, in large part, to enhancements in transportation and manufacturing (Martin, 1942). It would be expected, then, that medicine bottles would have a larger presence in the archaeological assemblage at both sites in the period following the Civil War.

As mentioned previously, the glass assemblage at both sites consists primarily of small pieces, which are difficult to associate with specific contents. Knowing that medicine primarily used "panel" bottles (United States Department of the Interior – Bureau of Land Management, Historic Glass Bottle Identification & Information Website), when the bottle shape could be identified it was possible to at least tentatively assign these artifacts to the "Medicine" category. In a few instances, enough of a maker's mark or company name was visible to allow more specific identification of the bottle contents and/or a date range for its manufacture.

At the Limpus site, fragments from a total of seven panel bottles were identified, although they were not able to be specifically identified as "medicine" bottles. Fragments from five of these bottles were found in the 20-30 cm level, one of which was dated to the period from 1875-1925 owing to its "prescription" style of lip. Fragments of two panel bottles were found in the 10-20 cm level.

At the Straub site, a total of three medicine bottles were found in situ. In the 10-20 cm level, two bottles were found. One bottle was the Dr. Kilmer's Swamp Root bottle mentioned earlier, dating to no earlier than 1886. The second bottle is from S.F. Baker & Co., dating to no earlier than 1905. The third bottle was found in the 0-10 cm level,

which was identified as “Chas. H. Fletcher’s Castoria,” from the Centaur Company, dating between 1871 and 1920. An additional four medicine-type bottles were identified in the “trash pit” unit (15W/27N). One bottle was dated to between 1840 and 1910 based on the manufacturing style of its base, but no other associations could be made with these bottles.

As expected, medicine and medicine-type bottles were not found in the very earliest level at either site. When present, they were predominantly in the 20-30 cm and 10-20 cm levels, and the amount of medicine bottles is the same at both sites. When dating was possible, they all dated to the post-Civil War period. This does not provide conclusive evidence with respect to socio-economic status for these sites, but it does seem to indicate (at least in this initial study) that these products were equally available to the families at both sites during the post-Civil War period.

**Summary**

While it is clear that analysis of individual artifact types can greatly assist with the overall picture of socio-economic status at a site, and its change over time, particularly key artifact types such as gun parts, luxury goods and medicine bottles, the larger pattern holds the key to a broader analysis of socio-economic response to stresses such as chronic warfare and the subsequent rebuilding. While each site contains interesting and useful information on its own, these larger patterns are what allow comparison at multiple levels – national, local and individual.

The use of Stanley South’s pattern recognition method, comparing the percentage of kitchen group artifacts to the percentage of structural group artifacts as reflected in

either the Frontier Pattern or Carolina Pattern (South, 1977), provides a good basis for recognizing behaviors related to stresses in the cultural, political or economic environment. It has often been used in previous studies to more carefully pinpoint a site's chronology. This study demonstrates that these patterns can enlighten us further about behavior over time and, potentially, over space. Individuals make choices—but always within constraints—about where and how to allocate resources. In most cases, those resources are finite. The environment in which people live provides opportunities and limitations, including extreme stressors which require strategies for survival. These behaviors and choices are reflected in the material culture left behind at sites such as these in Bates County, and its meaning can be interpreted using a model such as this.

When used in this context, and in this geographic area, it is almost misleading to continue to use the term "Frontier" or "Carolina" in the pattern name, as that is highly indicative of a period or place. As seen clearly at the Straub site, and to a certain extent at the Limpus site, this pattern also indicates a behavioral response to economic stresses – the stresses encountered through the course of a decade of chronic warfare, and the stresses encountered in the subsequent rebuilding and the significant financial burdens that entailed – long after the "frontier" no longer existed, at least not in the sense that we think of typically. This pattern can be referred to as the Bates County Pattern, which is independent of time or place, but looks specifically at behavioral responses to resource stresses brought about by persistent warfare.

What remained, after the geographical boundary of the frontier had vanished, and after ten years of fighting had subsided, was a new kind of frontier. It was a frontier of reconstruction; a frontier of reconnecting; a frontier of economic hardship; a frontier of

unknown choices and opportunities. The ripple effect from that frontier still moves through the community in Bates County today, and will be the subject of discussion in the next chapter. The model that has been established, the interpretation that it allows at these sites and its ramifications for future research will be discussed in detail in Chapter VI: Conclusions.

# Chapter VI
# Summary and Conclusions

*"If there be a connecting theme in the following pages, it is this: an insistence that the archaeologist is digging up, not things, but people."*
R.E. Mortimer Wheeler, 1954. *Archaeology from the Earth*. Oxford University Press, Oxford.

## *Introduction*

As stated in Chapter 1, the primary goal of this research is to understand and define a baseline pattern with which to establish a model for socioeconomic response to chronic warfare on the 19th century Missouri/Kansas border that can be used in understanding the impact of the war and its ongoing legacy. Since little work has been done to date on the impact of chronic warfare on civilian populations within the context of the American Civil War, it is necessary to define an initial pattern of archaeological signatures—what the archaeological record can be expected to reveal in detail and in general--against which future work may be compared. This is a contribution to a broader goal of encouraging further investigations of historical archaeology for the purpose of contributing to discussions about chronic warfare, guerilla warfare, and the ways that material culture reflects and defines rural culture in the midst of active, violent conflict and the displacement, relocation, and resettlement of both combatants and refugees. I have been interested in seeing in detail how frontier warfare produced changes in American landscapes and populations.

Much like other archaeological work which focuses on the material evidence of warfare and its short-term and long-term impact (such as those instances discussed in Chapter I with respect to the Maya (Demerest, 2006), and the American Southwest (LeBlanc, 1999; Turner & Turner, 1998), and historic sites in Colorado (Saitta, 2002, 2004, 2009)), this research has led to the development of a "Bates County Pattern." This

pattern can be used to not only explain the phenomena uncovered at the Straub and Limpus sites, but also test other sites in the surrounding area to discover the extent to which the long-term guerrilla warfare had an impact. When combined with modern ethnographic studies, it can also be used as a predictive model to ascertain the level of potential cultural disruption that may occur in current war-torn areas across the globe. Previous historical and military studies of General Order No. 11 have questioned its effectiveness and utility (Mink, 1970). This work will help to answer those questions, and to add to future research about similar military actions in present-day societies and situations.

There were two main hypotheses stated at the outset:

*Hypothesis 1: A pattern of economic response to long-term chronic warfare on the Kansas-Missouri border can be defined and differentiated from economic patterns during the later period of recovery and reconstruction;* and

*Hypothesis 2: The archaeological record will be able to provide a depth and type of data that cannot be found in the existing historical record.*

Two main research questions were engaged. The first concerned chronology and whether it was possible to establish temporal control with sufficient detail to reliably identify materials associated with the relevant period of guerrilla warfare in question (approximately 1855-1865) and the period of reconstruction that followed (primarily post 1870). The second concerned the ability to establish reliable indicators of economic status and/or change in economic status. The research presented in the preceding chapters has demonstrated that fine-grained temporal control is possible at historic sites in the

area, and that indicators of economic status are available. Furthermore, the data presented as part of this research has supported both of the initial hypotheses.

### *Addressing Hypothesis 1: Historic Sites and Temporal Control*

Historic sites often provide cultural material that can be associated with specific dates, periods and/or sources. For example, maker's marks can be narrowed down to a set date or a narrow range of dates of manufacture. Plat maps, deeds and tax records can define similarly narrow periods of occupation. The presence/absence of these artifact types and associated historical records can be used to establish absolute dates with greater precision. This has been essential in a research project that aims to compare standards of living in time periods that are no more than a decade apart.

However, historic sites are often very shallow deposits and in rural areas such as Bates County are subject to disturbance by plowing, scraping, construction or other farm-related activities. Even in undisturbed sites with date-specific materials, separating out occupation levels on a decadal scale can be difficult. Incomplete and/or missing written records create further challenges.

As demonstrated in Chapter V, a fine-tuned analysis of a few key artifact types helps to create a much clearer temporal picture that can be used for unit-by-unit comparison. Using the overlapping dataset approach articulated by Stanley South (1977), I compared artifact types such as ceramics, gun parts, glass, nails and window glass to create a site chronology. Overall, the most reliable, consistent and specific dataset for establishing site chronology was the window glass. Since this analysis was necessarily on a decadal scale, having a data set with a margin of error of +/- six years proved to be

extremely useful. The dates from the window glass analysis also proved extremely useful for testing temporal control within units and across the site. When data from other artifact types overlapped with that from window glass, the chronological picture became even clearer. Window glass was also useful for determining which areas of the site had the most disturbance, and which areas were stratigraphically intact.

Each material-based dataset by itself provided some chronological data, but many of these datasets--in particular the nails and the non-window glass --could not be used on a decadal scale. Intact or mostly intact bottles would make it possible to use methods of manufacture to get more specific date-ranges. However, at the Straub (23BT1128) and Limpus (L23BT1129) sites, most of the glassware was fragmentary, leaving the color of the glass the most consistent and reliable chronological indicator. While this is not as accurate as the use of intact or mostly intact, dateable bottles, it does reveal chronological trends, particularly when combined with other datasets.

The faunal material, while not useful for establishing specific dates or date ranges, proved to be an interesting ancillary dataset for site chronology. Knowing the site histories and their beginnings in a frontier period and then moving into and through the late 19$^{th}$ century was useful for comparing the amount and type of food remains in each level of the site. Once I established site chronology by the other datasets, I could see that the earlier deposits contained more wild food resources and the later deposits reflected a switch to more domesticated resources and purchased food items. This is a pattern to keep in mind for future studies.

While historic sites present many chronological challenges, the methods I used show that chronological control is possible even at shallow sites with few date-specific

artifacts. A careful analysis of window glass, bottle (and other) glass colors, nail types, gun parts and ceramics, augmented with faunal remains, can paint a robust and detailed chronological picture. As always, in archaeology, chronological control is critical when interpreting a site and painting a picture of how people lived in a particular time and place. When establishing a model of behavior, this kind of chronological control is no less important. Models such as those which use the Bates County Pattern, to be explained in more detail below, are looking at generalized patterns of behavior across time and space. In order for the model to be a valid means of interpretation, testing and prediction, it must be shown that the various time periods in question can be determined, and isolated, so that the material record can be adequately analyzed to reveal trends. Without this level of chronological control, the change across time (or lack of change) cannot be reliably established. The methods used in this study show that this level of chronological control is possible in Bates County, thereby establishing the necessary foundation for the Bates County Pattern described below.

### *Addressing Hypothesis 2: Modeling Warfare as an Agent of Culture Change*

Archaeology in Bates County has shown that there is a distinct Bates County Pattern, demonstrating socioeconomic responses to chronic violence. During the Border War of 1854-1865, ongoing, long-term guerrilla warfare was a fact of life for the residents of western Missouri and eastern Kansas. Sites in Missouri illustrate patterns of rural response to conflict, which demonstrate a long-term depression of socio-economic status.

Individual artifact types assist with reconstructing socioeconomic status at a site and its change over time. Key artifact types such as gun parts, luxury goods and medicine bottles help establish a larger pattern with which to conduct a broader analysis of socioeconomic responses to chronic warfare and post-conflict rebuilding. The idiosyncratic nature of particular sites means there will be differences in socio-economic responses and individual choices with respect to goods purchased and maintained in the home. However, while each site contains interesting and useful information on its own, it is the larger patterns that allow comparison at multiple levels – national, local and individual. These larger patterns appear in close analysis of the data.

These patterns have often been used in previous studies to more carefully pinpoint a site's chronology (i.e., Resnick, 1988). The use of these patterns has not been without criticism, however. In their 1981 article, Waselkov and Paul articulate the weaknesses that they perceive with South's Frontier Pattern and similar approaches. One initial criticism that they have is the small sample size South used to identify this pattern (at the time, three different sites). Since then, however, this pattern has been tested at additional sites (i.e. Resnick, 1988), and the work done at the Straub and Limpus sites will only add to this growing dataset. More to the analytical point, however, Waselkov and Paul identified what they see as two flaws with South's approach:

> "1. the aim is to explain the archaeological record rather than use archaeology to solve anthropological problems; and
>
> 2. the main concern is with synchronic patterns detached from the dynamic process which produced these patterns in the archaeological record," (Waselkov and Paul, 1981).

My use of this method addresses both of these critiques directly, and demonstrates that the Bates County Pattern (or, for that matter, the Frontier or Carolina Pattern), does not have to simply be a chronological and explanatory tool. Rather, the Bates County Pattern allows us to look at the patterns and processes as a dynamic unit, providing a richer overall picture of human behavior and adaptation. As mentioned in Chapter V, the Bates County Pattern is not just a useful chronological tool, but rather is a material expression of behavior. Key anthropological questions deal with human behavior, adaptation, and the causes of change. This pattern, in conjunction with what we know of the historical events in the area, shows that this behavior, adaptation and change is expressed in a pattern way in the archaeological record. By looking at these multiple lines of evidence, the Bates County Pattern becomes a useful predictive and interpretive tool when looking at similar assemblages at other sites, even when the accompanying historical records are not available.

At both sites, four key phases were identified with the chronological analysis: 1) Early Settlement (ca. 1840s-1850s); 2) Border War/Civil War (ca. 1850s-1860s); 3) Civil War/Post-War Rebuilding (1870s-1890s); and 4) Late 19$^{th}$/ Early 20$^{th}$ Century (ca. 1890s-1920s). With the identification of these phases, an analysis of socioeconomic responses to chronic warfare is possible. My use of Stanley South's pattern recognition method, comparing the percentage of kitchen group artifacts to the percentage of structural group artifacts as reflected in either the Frontier Pattern or Carolina Pattern (South, 1977), showed promising initial results. However, my study demonstrates that these same patterns can enlighten us further about behavior over time and space, including individual choices about where and how to allocate resources. The environment in which people live

can be interpreted as a range of opportunities and limitations, including extreme stressors that require strategies for survival. The ways in which specific behaviors and choices select among these opportunities are reflected in material culture and their meaning can be interpreted.

Within the context of the Border War and its aftermath, these responses as reflected in the material culture can be referred to as a Bates County Pattern. As seen clearly at the Straub site and to a certain extent at the Limpus site, the distribution of material culture that has been associated with South's Frontier pattern in the southeastern United States (namely, the majority of the assemblage being made up of structural materials, with a much smaller percentage containing household/kitchen materials), is expressed along the western Missouri Border as the Bates County Pattern. This pattern is not constrained to a particular time period, but indicates a behavioral response to economic stresses – the stresses encountered through the course of a decade of chronic warfare, and the stresses encountered in the subsequent rebuilding and the significant financial burdens that entailed – long after the "frontier" no longer existed.

The key element of the Bates County Pattern is a higher ratio of structural material to kitchen/household material (generally, a 2:1 ratio). This would be explained behaviorally by an overall focus on infrastructure building and either the lack of access to or the lack of emphasis on kitchen/household items. This could also be true of any individual/family, regardless of initial or current socioeconomic status. Stan South's "Carolina Pattern" reverses this ratio, indicating a shift in emphasis/behavior from infrastructure building to building up of household goods. Again, regardless of the economic value of individual items, these ratios show the pressures operating at the time

and the choices that had to be made, regardless of individual economic status. In Bates County, however, this reversal of the ratio occurs in only one phase, at the Limpus site, and it is not clear that the excavated portion of the site was the homestead location, or whether it was a trash deposit while the homestead was located elsewhere at the site. Another key component of the Bates County Pattern, then, is that this ratio reversal does not happen, at least at sites associated with families who were present during and after the Border War period.

One problematic aspect of an idiosyncratic analysis of socioeconomic status appears when one attempts to compare that across time and space and to include a variety of sites. How does one measure a meaningful increase or decrease in that level as a response to external pressures, such as the consequences of chronic warfare? Each family or individual would begin with their own socioeconomic level. If one is still able to purchase some luxury items, does that mean that they were unaffected by warfare? Or were they participating in the economy at a lower level than they would have if the war had not had such a devastating impact? Or did they benefit from specific circumstances of warfare, such as occasional looting of luxury goods that were then redistributed in an atypical pattern? The best way to measure this is to look at the larger trends over time and space so that individual economic differences are minimized but the ability to fully realize their economic potential, whatever that may be, is maximized.

In is in these circumstances where the Bates County Pattern is useful. This allows us to look at larger trends and examine the ability of individuals and families to shift their focus from mostly infrastructure concerns, to quality of life concerns. If the Bates County Pattern is present in a time and place when the "frontier" is no longer present, this makes

a strong statement about behavior in response to social and/or economic pressures. What it tells us is that these households were constrained, long-term, by economic pressures which prevented them from moving beyond basic infrastructure concerns primarily associated with frontier lifestyles. Knowing that these families were directly affected by the Border War, and ten years of persistent guerrilla warfare, this demonstrates a compelling link between the ongoing violence and their long-term socioeconomic depression.

At both the Straub and Limpus sites, the Bates County Pattern is present in the Early Settlement phase (ca. 1840s-1850s). This is expected because it encompasses the period when this area was indeed a true frontier, from the 1840s up until the 1850s or 1860s. It reflects the necessary emphasis on building a home and other necessary structures, without a primary emphasis on higher-end items or luxury goods (Jurney, 1987d). At the Limpus site, the ratio between structural and kitchen/household goods shows less of a difference, but since the excavated area was likely a grocery during this period, the higher percentage of kitchen goods would be consistent with an inventory kept at a trading post or grocery. This is an expected result.

The Bates County Pattern continues at both sites in the Border War/Civil War phase (ca. 1850s-1860s). We know from the history of the area that this was a time of significant conflict and property destruction (including that of General Order No. 11). The ratio between structural and kitchen/household goods at the Limpus site is almost identical to that at the site from the previous period. This could again be explained by the original use of the site as a grocery story. At the Straub site, there is a slight decrease in kitchen/household items.

During the Civil War/ Post-War Rebuilding phase (ca. 1870s-1890s), the ratio is at its greatest, showing stark contrast with previous periods at both sites. Structural material is at its highest percentage and the kitchen/household material at its lowest percentage in any of the phases. This was a period when many people were coming back to properties that had been completely destroyed by General Order No. 11. Even if the individuals rebuilding were not the original owners of the property (although this was not the case at either site), it would still require significant investment in infrastructure at the expense of other goods, regardless of their value. This, again, is an expected result.

The fourth phase, the Late 19th and Early 20th Century (ca. 1890s-1920s), contains the most interesting results. During this period, after the war and Reconstruction had ended and when industrialization had increased, one would expect the Bates County Pattern to be reversed. However, contrary to expectations, the Bates County Pattern persisted at the Straub site. The percentage of structural artifacts decreased and the percentage of kitchen/household items increased, but the ratio is still almost 2:1. It is clear that this family is still displaying the Bates County Pattern long after the war had ended. As stated earlier, the continuation of this pattern indicates a patterned response to economic pressures present in Bates County over the decades following the war. This family was still feeling the effects of the Border War and its persistent violence at the social and economic level. Growth and prosperity in this portion of Bates County was likely at a low enough level, as a result of the depth of devastation across the landscape, that families living in the area still had to spend a disproportionate amount of their income on infrastructure, as opposed to discretionary or household items.

At the Limpus site, unlike the Straub site, one sees a reversal of the Bates County Pattern in the fourth phase. However, it is important to keep site use in mind when looking at this phase. The structural material is at its lowest percentage of all four phases, and is certainly at its lowest percentage at either site. The kitchen/household items are at the highest percentage at any phase from either site. Could this be because the occupants of the Limpus site were unaffected by the long-term effects of chronic warfare, or were somehow economically advantaged – significantly so – in a way that the residents of the Straub site were not? Or is there another possible answer? Nothing in the available historical record (specifically census records and tax records) indicates that the residents of the Limpus site were in any way economically advantaged, particularly when compared with the residents of the Straub site. There is also nothing to indicate that they escaped the impact of the Border War or General Order No. 11, in a way that those at the Straub site were unable to do. Additionally, the material record of the Limpus site does not demonstrate a higher level of luxury items, for instance, or any significant differences in diet or other components of the assemblage. What is known, however, is that there was a grocery on the site in the very earliest phase of its occupation, and that later (ca 1850s) the J.J. Clark family took over the site as a homestead. Additionally, it is not clear that an additional area of the Limpus site wasn't used as the primary homestead at some point after the war. While the area previously associated with the grocery may have been re-purposed as a homestead (and the archaeology seems to indicate that it was, at least during the Border War period and for a time after), it is not clear that it was continuously used as the primary homestead.

Given the available historical and archaeological evidence, it is very likely that the reversal in the Bates County Pattern is due to the fact that the excavated area at the Limpus site was no longer in use as the homestead during the 1890s-1920s phase. The primary area of excavation at the Limpus site focused on the grocery. It has yet to be determined the extent to which that area was used by the J.J. Clark family during and after the Civil War. There is no indication yet whether the Clark farmstead was located at the site. If it was, then the area that had previously been the grocery could have been abandoned and used as a trash pile in the fourth phase at the Limpus site. This would explain the significant decrease in structural materials and the much higher percentage of kitchen/household items.

My second hypothesis, that the archaeological record of Bates County can provide a depth and type of data not available in historical accounts, is clearly demonstrated by these findings. Not only are many historical documents unavailable or incomplete, but they do not provide access to the kind of general patterns of behavior necessary for determining this level of socioeconomic response to warfare. The available historical documentation provides an important and invaluable level of context typically not available at prehistoric sites, but it is the archaeological record in this case that allows the insight into these broader patterns of behavior.

My evaluation of the two hypotheses—establishing chronological control and identifying meaningful patterns within relatively short historical periods—contributes to my construction of a model of socioeconomic responses to chronic warfare and its aftermath during the Border Wars of Kansas and Missouri. My model is based upon modified interpretations of South's Frontier and Carolina patterns for rural homesteads.

This model, using the newly defined Bates County Pattern, can be used to evaluate the socioeconomic pressures existing within the environment at a given time, and the circumstances within which this pattern would no longer be present. The primary component of the Bates County Pattern is a 2:1 ratio of structural material to household/kitchen items in the archaeological assemblage, which persists well beyond the settlement of the western Missouri frontier, the Border War, and the period of Reconstruction which came after, up until the 1920s.

Hypothesis 1 states: *A pattern of economic response to long-term chronic warfare on the Kansas-Missouri border can be defined and differentiated from economic patterns during the later period of recovery and reconstruction.* Although my assessment is preliminary and not definitive, this appears to have been the case in Bates County. As I overcame potential issues with chronology and demonstrated the utility of South's Frontier and Carolina Patterns for showing socioeconomic behaviors, the Bates County Pattern began to appear. At the Straub site, the Bates County Pattern persists long after the actual frontier has changed. With the coming of Kansas statehood in 1861, Missouri was no longer at the western frontier of the United States. By the time of the end of the Civil War, and into the period of Reconstruction, the increase of commerce and rail travel put western Missouri at the heart of the country's operations, not at the outer edge. At the Limpus site, the Bates County Pattern persists through all but the fourth phase. The site's function as a grocery in the earliest phase, and its change in use in later phases may explain why the pattern changes there and not at the Straub site.

Hypothesis 2 states: *The archaeological record will be able to provide a depth and type of data that cannot be found in the existing historical record.* This has been

demonstrated. The historical records in Bates County for the Civil War period and before are sparse, at best. Archaeology helps fill in the record when that is the case. However, archaeology also adds to the historical record for the years following the war. Trends such as the ones described at the Straub and Limpus sites have not been recorded in history books, personal letters, or diaries available for Bates County. Trends such as these can be difficult to tease out of the written record. I have used archaeology to show that the material record has much to say when it is carefully examined.

Having established that chronological control on a decadal scale is possible in Bates County archaeological sites, and that the archaeological record can illuminate patterns of behavior in response to socioeconomic conditions over space and time, a specific pattern – the Bates County Pattern – can be defined. This pattern provides the following working model for evaluating a response to and the long-term impact of chronic warfare in Bates County:

1.) The chronic warfare of the Border War, either through direct violence or threat of violence, resulted in a constriction of resources during the Border War period, with the focus of resources being on infrastructure in a way that resembles a frontier environment.
2.) The widespread devastation left in the wake of General Order No. 11 depressed economic growth following the war, and resulted in a continued constriction of resources.
3.) Into the late 19$^{th}$ and early 20$^{th}$ centuries, the impact of General Order No. 11 continued to repress economic growth in the areas hardest hit by these events,

even as other parts of Bates County experienced relatively modest or even robust growth (such as that of the coal mining boom in the Rich Hill area).

As discussed earlier, the archaeological data at the Straub and Limpus sites shows a clear presence of the Bates County Pattern, indicating a long-term constriction of resources as a result of socioeconomic stresses. Using the methods described in Chapter V, the presence of this pattern can continue to be re-evaluated at these sites and at other sites in Bates County, to determine the extent to which this model can be validated in Bates County and beyond.

The historical record can inform us to a great extent about the immediate devastation brought about by conflict, either in the context of a large battle or smaller guerrilla engagements. The personal stories of tragedy and triumph can be illuminated, but the long-term cost to the civilian population has not been the focus of most historical accounts, or even most archaeological research related to the Civil War. To further complicate matters, General Order No. 11 was unique in its approach and scope, and had its impact on an area of the country that did not regularly engage in the larger, strategically critical battles of the Civil War such as those being conducted in the eastern theatre near the northern and southern capitals. Perhaps for this reason, Missouri's role in the Civil War, and the impact on its citizens, has taken a "back seat" archaeologically speaking.

This model now provides a framework for understanding the long-term impact of this unique and devastating event in our country's history. By looking at the Bates County Pattern present at these sites, a picture begins to emerge of a struggle for

rebuilding amid a legacy of violence and disruption. By using this model, and validating this pattern, we can begin to see the real long-term impact of guerrilla warfare in Bates County, beyond the individual portraits painted by historical accounts. This model provides a method for seeing broad patterns of behavior, which are a reflection of real day-to-day choices which must be made.

Beyond understanding the impact of guerrilla warfare, this model can also provide a framework for understanding the long-term social, economic and cultural impact of state-level intervention on the scale of General Order No. 11. At the time of its inception, this was a unique approach to warfare in the United States, but this form of "total war" has been used with increasing regularity (Keeley, 1996) across the globe. The utility of this type of approach has been called into question in historical and military circles (Mink, 1970), and the use of this model and the Bates County Pattern can provide important insight into the long-term impact of these actions. The Bates County Pattern indicates that the long-term economic impacts are negative, and that the descendant communities must deal with these actions for generations after the events have passed. This level of understanding is extremely useful not only for evaluating past events, but for determining the utility of present and future actions as well.

### *The Long-Term Impact of Archaeology in Bates County*

My work in Bates County has engaged the aims of archaeology to be educational and to work with local and/or descendant communities. While the long-term impact remains to be seen, there are a few developments that point to the influence archaeology

has had on the community and the community's ability to participate more actively in the construction of its own cultural identities.

The county's participation in the Freedom's Frontier National Heritage Area is one example of this. A National Heritage Area is created by an Act of Congress, for the purpose of recognizing and promoting the history and heritage of a particular site, and to encourage historic preservation in the area. This National Heritage Area includes 41 counties - 29 in Kansas and 12 in Missouri - , and was established to reinforce the national importance of understanding the events and the legacy of the Border War. As originally conceived, this National Heritage Area focused entirely on Kansas and the impact of the Border War on its communities. It was introduced as Senate Bill 175 in January of 2005, and entitled the Bleeding Kansas and Struggle for Enduring Freedom Heritage Area. However, citizens in Missouri, including legislators, pointed out that this Heritage Area should include the Missouri side of the story as well. The area was subsequently broadened to include the entire history of the Border War, both in Kansas and Missouri, although the headquarters for the Heritage Area remains in Lawrence and the largest part of the Heritage Area is in Kansas. Because a primary focus of a National Heritage Area is that of historic preservation, my archaeological work in Bates County has provided a foundation for local historical groups to include their story within the context of this broader history.

In conjunction with my archaeological field programs in the county, the Bates County History Museum has sponsored at least one Public Archaeology Day each field season. On these Public Archaeology Days, individuals from the community and outside visitors are invited to see the archaeological site and witness first-hand not only how

archaeology is done but the information that can be gained from it. The benefits have been two-fold. First, the community has come to understand that archaeology is not an abstract, academic pursuit with no connection to their lives. They see that it engages questions directly related to them, their community, and to their past as well as their present. Rather than fostering an "Us vs. Them" attitude, members of local communities come to appreciate the "We" that is a part of archaeology. Secondly, they come to better appreciate their roles in the preservation of cultural heritage. They understand and appreciate that their part of the story is important, valid, and appreciated. As a result of these efforts, over the course of my five years of research in Bates County, attendance and donations at the local museum in Butler have increased.

Bringing schoolteachers into the archaeological research provided another avenue for descendant communities in Bates County to both learn about and tell their side of the story and its impact on different generations. Working with Dr. Cynthia Jones, who is a member of the Classics and History faculty at the University of Missouri-Kansas City, we developed a two-day teacher training program that exposed local teachers not only to the history of the Border War using stories from both sides of the conflict, but also gave them first-hand experience at archaeological excavation. This allowed them to better understand the kind of information that archaeology contributes to an understanding of the past and to incorporate it into their elementary and secondary school curricula.

The Department of History at the University of Missouri-Kansas City also developed a week-long education program for teachers aimed at exposing them to the history of the Border Wars. This program, entitled "Crossroads of Conflict: Contested Visions of Freedom & the Missouri-Kansas Border Wars," is sponsored by a grant from

the National Endowment for the Humanities. When my work in Bates County was brought to the attention of the UMKC faculty, the second edition of this program was crafted to include a stop to visit the archaeological excavations in Bates County, the Bates County History Museum, and to participate in a series of lectures about Bates County's role in the Border Wars. The archaeological work was the primary attraction for including Bates County as a part of the program.

Another related endeavor has been establishment of the Battle of Island Mound State Historic Site in Bates County. This site was established by the State of Missouri ,in 2010, to open to the public in the fall of 2012, to commemorate the significance of the first engagement of African-American soldiers in the Civil War. However, its presence in Bates County is yet another example of the complexity of cultural heritage. Bates was unquestionably a pro-slavery county during the Civil War, and its population of African-Americans has declined since then. The historic site is the largest Civil War memorial to African-American soldiers from Kansas, a regiment that defeated local Confederate guerrillas.

The only statue on the Butler town square related to the Civil War is of a Kansas First Colored Volunteer Infantry soldier, erected in 2010, and paid for privately by a local African-American group who wished to contribute to the memory of this heritage. This statue was erected separately from the establishment of the State Historic Site, although the support for this statue was certainly bolstered by the creation of the Historic Site in the area. While honoring former slaves and their descendants may seem counterintuitive to many outside the county, the statue on the square and the creation of this State Historic

Site have contributed to the county's pride in being able to demonstrate the importance of its history within the broader context of the war.

I conducted archaeological research at the Battle of Island Mound State Historic Site in the summer of 2011 (see Appendix D). The Bates County History Museum sponsored a Public Archaeology Day in conjunction with this fieldwork. This particular event attracted the largest attendance at any single Public Archaeology Day since their establishment in 2008, almost 75 individuals. Individuals from within the county as well as from other areas in Missouri and Kansas (including descendants of some of the Kansas First Colored Volunteer Infantry soldiers) came to hear about the history and the archaeology of this significant place. This show of interest and support was not only energizing for the residents of Bates County, but made an impression upon the officials within the Missouri State Parks system, demonstrating the level of interest in the history and archaeology of Bates County.

Evidence of a long-term impact of archaeology in Bates County remains to be seen. I have planned additional archaeological work for the summers of 2012 and 2014 and the National Endowment for the Humanities grant program through UMKC will also take place during the summer of 2012. The Bates County History Museum has several events planned for October 2012 in conjunction with the 150$^{th}$ anniversary of the Battle of Island Mound and the official opening of the State Historic Site. The County also continues to participate actively with the Freedom's Frontier National Heritage Area and its other members. Local individuals are becoming increasingly involved with the Museum and its activities. It is a challenge to maintain and increase the current level of involvement and activity. Whether this will happen over the long term is unknown, but I

believe that my research will play a part in fostering local pride and responsibility for cultural property and cultural heritage.

### *Future Research*

My research has been only the first step in creating a model for socioeconomic response to warfare in rural communities during the Civil War. As stated earlier, most Civil War archaeology to date has focused on battlefields and/or sites associated with specific individuals. Very little has been done on civilian sites to determine the impact of warfare during and after the conflict. My research demonstrates that it is possible to recognize meaningful patterns in the Civil War archaeological record in Bates County – ones that reveal long-term socioeconomic impact on rural communities.

In order to determine conclusively whether this pattern is widespread in the area, much more additional archaeological work must be done. Further fieldwork at the Straub site will help determine whether the pattern holds up to the scrutiny that would be provided by a larger sample. More work at the Limpus site would clarify whether the patterns there are related to socioeconomic trends, or to site use. If the J.J. Clark farmstead can be located, the pattern at the Limpus site could be compared more accurately to the one at the Straub site.

Other sites in Bates County should be excavated to compare their patterns with those already documented. Depopulation of the county was more complete and severe in the western than in the eastern portion (Gerlach, 1986). It would be useful to do a county- or region-wide reconstruction to see if the pattern is evident across the county or if it changes in different areas. Is the Bates County Pattern present only on the far western

border, the area that was hardest hit by the guerrilla fighting as well as General Order No. 11? Was the entire county equally affected over the long term? Were other areas outside of Bates County affected in a similar way? Excavating additional sites in Bates County and in adjacent counties would provide comparative material to strengthen the model and determine the extent to which the chronic guerrilla warfare in the border region had a long-term impact on its residents.

W.O. Atkeson noted in his *History of Bates County, Missouri*,"The history of the county until the close of the war, remains a blank… Bates County ceased to exist from September of 1863 to the close of the war" (1918). My research has begun to fill in that blank, helping Bates County to once again exist during those invisible years.

## Appendix A
## Organizations and Institutions for Historical Research

Bates County Museum
PO Box 164
Butler, MO 64730
(660) 679-0134
bcmuseum@earthlink.net
Nita Thompson, Curator
Peggy Buhr, Assistant

Family History Center
208 N. Delaware
Butler, MO 64730
(660) 679-0134
Melissa Phillips - thos7black@yahoo.com
Betty Newton

Missouri Historical Society - Western Historic Manuscripts Collection (Kansas City)
302 Newcomb Hall
University of Missouri-Kansas City
5100 Rockhill Road
Kansas City, MO 64110
(816) 235-1543
WHMCKC@umkc.edu
David Butris

Spencer Research Library
Kansas Collection
The University of Kansas
1450 Poplar Lane
Lawrence, KS 66045
(785) 864-4334
Sheryl K. Williams -Interim Head, Spencer Research Library, Curator of the Kansas Collection
swilliam@ku.edu

Kansas State Historical Society
State Archives & Library
6425 SW Sixth Avenue
Topeka KS 66615-1099
785-272-8681, ext. 117

Bushwhacker Museum
212 W. Walnut (in the Nevada Public Library)
Nevada, MO  64772
417-667-9602
Terry Ramsey - 417-667-8425
Patrick Brophy at 417-667-7108
Stafford Agee - 417-667-5629

The State Historical Society of Missouri
1020 Lowry Street
Columbia, MO 65201
(800) 747-6366
(573) 882-7083
shsofmo@umsystem.edu

## Appendix B
## Local Area Newspapers

A list of Bates County Newspapers is listed below, with their city and available issues included (information from The State Historical Society of Missouri website).

**Adrian**
*Adrian Journal*: Mar 7, 1889-Dec 30, 1892; Jan 13, 1893-Dec 16, 1909; Jan 13, 1910-present (www.adrianjournal.com)

*Register*: Jly 2, 1886-Mar 10, Apr 14-May 12, 1888

**Amoret**
*Chief*: Oct 3, 1890-Oct 30, 1891

**Amsterdam**
*The Border Banner*: Jly 24, 1931-Jly 14, 1939

*Border Chief*: Nov 13, 1891-Jun 23, 1893

*Amsterdam Enterprise*: Jly 9, 1903-Dec 28, 1905; Nov 14, 1907-Nov 21, 1918

**Butler**
*Bates County Advocate*: May 29-Nov 20, 1878

*Bates County Democrat*: Dec 30, 1869; Jan 20-Jun 23, Jly 14-Sep 8, 1870; Feb 9-May 4, Jly 13, 27-Oct 12, Nov 23-Dec 7, 21, 1871; Jan 18-Feb 1, 22-Apr 25, May 9-23, Jun 13-Aug 15, Sep 12-19, Nov 21-28, Dec 19-26, 1872; Jan 9-16, Feb 20, Mar 27-Apr 17, May 1, 22-Aug 21, Sep 18-Dec 4, 1873; Apr 9, May 28-Jun 4, 25-Aug 20, Sep 3-Nov 12, Dec 3, 1874; Jan 7-Jly 8, 22-Oct 21, Nov 18-Dec 30, 1875; Jan 6, 1876-Aug 8, Dec 12, 1878-Dec 4, 18, 1879; Jan 1-Aug 25, Sep 30-Nov 4, 25, Dec 9-30, 1880-Dec 22, 1881; Jan 5-Nov 23, Dec 7-28, 1882-Nov 22, 1883; Feb 21-Apr 10-Jun 26, Jly 10-Oct 2, 16-30, 1884; Jan 28-Jun 17, Jly 1-Dec 30, 1886-Feb 3, Dec 15-29, 1887-Jan 5-Jly 26, Aug 9-Oct 6, 25-Nov 15, Dec 13, 1888; Jan 2, 1890-Dec 6, 1894; Dec 12, 1895-Dec 2, 1897; Jan 6-Dec 22, 1898; Jan 4, 1900-Dec 30, 1909; Jan 5, 1911-Feb 1, 1973

*Bates County News Headliner*: Jan 6, 1972-Aug 28, 1986

*Bates County Record*: Jly 4, 1868-Jun 22, 1872; Jun 28, 1873-Jun 5, 1886; Jun 9, 1888-Dec 20, 1902; Aug 22, 1903-Apr 26, 1918

*Bates County Times*: Dec 25, 1878-Nov 23, 1881

*Butler Daily Democrat*: May 17-Jun 26, 29-Aug 9, 1882; Aug 15, 1889-Mar 22, Apr 1-3, 5-May 1, 4-Nov 17, 19-27, 30, 1893-Jly 25, 28, 1895-Dec 9, 11, 13-29, 1896-Apr 9, 11-

Dec 3, 5-31, 1897-Mar 13, 15, 17, 19-21, 23-31, Apr 3-17, 19-May 16, 18, 20-25, 27-Jun 9, 11-13, 15, 16, 18, 19, 21-27, 29-Dec 31, 1898-Jun 2, 4-8, 12-16, 18, 1899-Jan 1, 3, 7-11, 15, 28-30,-Dec 27, 29, 30, 1900-Jan 1, 3, 5-Aug 27, 29, 31-Sep 5, 7-9, 11-18, 21-30, Oct 3, 1901-Feb 21, 23-25, 27-Apr 9, 13-16, 18-23, 25-30, May 2-7, 9-11, 13-15, 17-23, 25-29, 31-Aug 4, 6, 9-Sep 21, 23, 25, 1902-Dec 30, 1905-Dec 25, 27, 28, 30, 1907-Mar 18, 20, 21, 25-Apr 5, 10-Nov 30, Dec 2-4, 7-23, 26, 1910-Dec 22, 24, 26, 1911-Jan 10, 12-May 3, 5-16, 19-Jly 3, 5-9, 11-17, 19-Sep 23, 29-Oct 15, 17-22, 24-Nov 11, 12-24, 26, 1912-Dec 11, 13-16, 21-26, 28, 1914-Dec 31, 1925; Jan 1, 1927-Dec 31, 1948

*Butler Free Press*: Jan 3, 1896-Jly 26, 1901

*The Local News*: Mar 22-Nov 23, 1889

*News-Xpress*: Sep 18, 1987-present (www.ad-xchanger.com)

*Republican Press*: Aug 2, 1901-Aug 31, 1950

*Weekly Times*: Dec 7, 1881-Apr 25, 1918

*Weekly Times and Bates County Record*: May 2, 1918-Aug 31, 1950

*Butler Times-Press*: Sep 7, 1950-Jun 27, 1957

*The Weekly Union*: Mar 16, 1893-Dec 27, 1895

**Foster**
*Foster News*: Oct 21-Nov 11, 1892

**Hume**
*The Hume Border Messenger*: Sep 17, 1925-Dec 29, 1966

*The Border Telephone*: Sep 5-26, Oct 17, 1896; Nov 5-Dec 24, 1898; Jan 7, 14, 28-Feb 18, 1899; Dec 15, 22, 1900; Jan 12-Feb 9, Jly 27, 1901-Sep 10, 1925

**Rich Hill**
*Bates County Republican*: Nov 7, 1919-Oct 17, 1958

*The Coming Nation*: Jun 7, 1902-Dec 26, 1903

*Rich Hill Mining Review*: Nov 24, 1898-present

*Daily Review*: Jan 1-Oct 29, 1895

*The Tribune*: Aug 1, 1901-Dec 29, 1910

*Western Enterprise*: Sep 16-Dec 23, 1881; Jan 6, 1882-Aug 19, 1892; Jly 4, 1902-Sep 16, 1904; Jan 3, 1905-Oct 31, 1919

**Rockville**
*Rockville Booster*: Aug 21, 28, Sep 11-Oct 23, Nov 6-Dec 25, 1908; Jan 1-Feb 5, 19-Apr 30, Jly 30, 1909; Jan 14, 28, Feb 4, 25-Mar 24, Apr 7, 1916

*Rockville Leader*: Apr 11-Jun 26, Jly 10-31, Aug 14-Sep 25, Oct 9-Nov 13, 1924; Oct 22-Dec 31, 1925; Jan 7-Aug 5, 19-Dec 16, 1926; Jan 13-Feb 24, Mar 10-24, Jun 16-Aug 18, Sep 1-Oct 6, 20-Dec 22, 1927; Jan 12-26, Feb 9-Mar 29, Apr 12-May 24, Jun 7, 22-29, Jly 13-27, Aug 10-Sep 14, 28-Oct 26, Nov 9-Dec 21, 1928; Jan 4, 1929; Apr 11, 1963-Sep 28, 1972

**Worland**
*Worland Watchman*: Apr 15-Aug 26, 1892

## Appendix C
## Window Glass Database

The following pages contain the window glass measurements from site 23BT1128 and 23BT1129, respectively. The data columns included in this appendix are: Site, Unit/Auger, Depth, Measurement #1, Measurement #2, Measurement #3, Mean Thickness, and Date of Manufacture.

The window glass analysis was completed in two phases, by two individuals. In the first phase, the three individual measurements were not recorded in the database, but the mean thickness was. This database is also included in the main catalog spreadsheet, as a separate tab. This database will be provided in electronic format as an Excel spreadsheet.

23BT1128 Window Glass Data:

| Site | Unit/Auger | Depth | #1 | #2 | #3 | Mean | Age of Manufacture |
|---|---|---|---|---|---|---|---|
| 23BT1128 | 12W/20.5N | 0-10 cm | | | | 2.69 | 1939 |
| 23BT1128 | 12W/20.5N | 0-10 cm | | | | 2.53 | 1926 |
| 23BT1128 | 12W/20.5N | 0-10 cm | | | | 2.43 | 1917 |
| 23BT1128 | 12W/20.5N | 0-10 cm | | | | 2.37 | 1912 |
| 23BT1128 | 12W/20.5N | 0-10 cm | | | | 2.35 | 1911 |
| 23BT1128 | 12W/20.5N | 0-10 cm | | | | 2.11 | 1890 |
| 23BT1128 | 12W/20.5N | 0-10 cm | | | | 1.86 | 1869 |
| 23BT1128 | 12W/20.5N | 0-10 cm | | | | 1.81 | 1865 |
| 23BT1128 | 12W/20.5N | 0-10 cm | | | | 1.77 | 1862 |
| 23BT1128 | 12W/20.5N | 0-10 cm | | | | 1.72 | 1858 |
| 23BT1128 | 12W/20.5N | 0-10 cm | | | | 1.66 | 1853 |
| 23BT1128 | 12W/20.5N | 0-10 cm | | | | 1.65 | 1852 |
| 23BT1128 | 12W/20.5N | 10-20 cm | | | | 1.81 | 1865 |
| 23BT1128 | 12W/20.5N | 10-20 cm | | | | 1.44 | 1834 |
| 23BT1128 | 12W/20.5N | 10-20 cm | | | | 1.29 | 1821 |
| 23BT1128 | 12W/20.5N | 10-20 cm | | | | 1.24 | 1817 |
| 23BT1128 | 12.5W/22N | 10-20 cm | | | | 2.05 | 1885 |
| 23BT1128 | 12.5W/23.5N | 0-10 cm | | | | 2.57 | 1929 |
| 23BT1128 | 12.5W/23.5N | 0-10 cm | | | | 2.42 | 1917 |
| 23BT1128 | 12.5W/23.5N | 0-10 cm | | | | 2.39 | 1914 |
| 23BT1128 | 12.5W/23.5N | 0-10 cm | | | | 2.25 | 1902 |
| 23BT1128 | 12.5W/23.5N | 0-10 cm | | | | 2.16 | 1895 |
| 23BT1128 | 12.5W/23.5N | 0-10 cm | | | | 2.14 | 1893 |
| 23BT1128 | 12.5W/23.5N | 0-10 cm | | | | 2.12 | 1891 |
| 23BT1128 | 12.5W/23.5N | 0-10 cm | | | | 2.1 | 1890 |
| 23BT1128 | 12.5W/23.5N | 0-10 cm | | | | 1.97 | 1879 |
| 23BT1128 | 12.5W/23.5N | 0-10 cm | | | | 1.68 | 1854 |
| 23BT1128 | 12.5W/23.5N | 0-10 cm | | | | 1.33 | 1825 |
| 23BT1128 | 12.5W/23.5N | 10-20 cm | | | | 2.7 | 1940 |
| 23BT1128 | 12.5W/23.5N | 10-20 cm | | | | 2.4 | 1915 |
| 23BT1128 | 12.5W/23.5N | 10-20 cm | | | | 1.9 | 1873 |
| 23BT1128 | 12.5W/23.5N | 10-20 cm | | | | 1.8 | 1864 |
| 23BT1128 | 12.5W/25N | 0-10 cm | | | | 2.43 | 1917 |
| 23BT1128 | 12.5W/25N | 0-10 cm | | | | 2.16 | 1895 |
| 23BT1128 | 12.5W/25N | 10-20 cm | | | | 2.97 | 1963 |
| 23BT1128 | 12.5W/25N | 10-20 cm | | | | 2.27 | 1904 |
| 23BT1128 | 12.5W/25N | 10-20 cm | | | | 2.06 | 1886 |
| 23BT1128 | 12.5W/25N | 10-20 cm | | | | 1.95 | 1877 |
| 23BT1128 | 12.5W/25N | 10-20 cm | | | | 1.9 | 1873 |
| 23BT1128 | 12W/26.5N | 0-10 cm | | | | 2.51 | 1924 |
| 23BT1128 | 12W/26.5N | 0-10 cm | | | | 2.46 | 1920 |
| 23BT1128 | 12W/26.5N | 0-10 cm | | | | 2.34 | 1910 |
| 23BT1128 | 12W/26.5N | 0-10 cm | | | | 1.89 | 1872 |
| 23BT1128 | 12W/26.5N | 0-10 cm | | | | 1.79 | 1863 |
| 23BT1128 | 12W/26.5N | 10-20 cm | | | | 2.5 | 1923 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 23BT1128 | 12W/26.5N | 10-20 cm | | | | 2.34 | 1910 |
| 23BT1128 | 12W/26.5N | 10-20 cm | | | | 2.11 | 1890 |
| 23BT1128 | 12W/26.5N | 10-20 cm | | | | 2.1 | 1890 |
| 23BT1128 | 12W/26.5N | 10-20 cm | | | | 2.07 | 1887 |
| 23BT1128 | 13W/28N | 0-10 cm | | | | 3.22 | 1984 |
| 23BT1128 | 13W/28N | 0-10 cm | | | | 3.14 | 1977 |
| 23BT1128 | 13W/28N | 0-10 cm | | | | 3.03 | 1968 |
| 23BT1128 | 13W/28N | 0-10 cm | | | | 3 | 1965 |
| 23BT1128 | 13W/28N | 0-10 cm | | | | 2.88 | 1955 |
| 23BT1128 | 13W/28N | 0-10 cm | | | | 2.87 | 1954 |
| 23BT1128 | 13W/28N | 0-10 cm | | | | 2.83 | 1951 |
| 23BT1128 | 13W/28N | 0-10 cm | | | | 2.78 | 1947 |
| 23BT1128 | 13W/28N | 0-10 cm | | | | 2.77 | 1946 |
| 23BT1128 | 13W/28N | 0-10 cm | | | | 2.72 | 1942 |
| 23BT1128 | 13W/28N | 0-10 cm | | | | 2.67 | 1938 |
| 23BT1128 | 13W/28N | 0-10 cm | | | | 2.64 | 1935 |
| 23BT1128 | 13W/28N | 0-10 cm | | | | 2.56 | 1928 |
| 23BT1128 | 13W/28N | 0-10 cm | | | | 2.42 | 1917 |
| 23BT1128 | 13W/28N | 0-10 cm | | | | 2.42 | 1917 |
| 23BT1128 | 13W/28N | 0-10 cm | | | | 2.36 | 1911 |
| 23BT1128 | 13W/28N | 0-10 cm | | | | 2.36 | 1911 |
| 23BT1128 | 13W/28N | 0-10 cm | | | | 2.35 | 1911 |
| 23BT1128 | 13W/28N | 0-10 cm | | | | 2.3 | 1906 |
| 23BT1128 | 13W/28N | 0-10 cm | | | | 2.3 | 1906 |
| 23BT1128 | 13W/28N | 0-10 cm | | | | 2.3 | 1906 |
| 23BT1128 | 13W/28N | 0-10 cm | | | | 2.29 | 1906 |
| 23BT1128 | 13W/28N | 0-10 cm | | | | 2.28 | 1905 |
| 23BT1128 | 13W/28N | 0-10 cm | | | | 2.25 | 1902 |
| 23BT1128 | 13W/28N | 0-10 cm | | | | 2.22 | 1900 |
| 23BT1128 | 13W/28N | 0-10 cm | | | | 2.19 | 1897 |
| 23BT1128 | 13W/28N | 0-10 cm | | | | 2.19 | 1897 |
| 23BT1128 | 13W/28N | 0-10 cm | | | | 2.19 | 1897 |
| 23BT1128 | 13W/28N | 0-10 cm | | | | 2.19 | 1897 |
| 23BT1128 | 13W/28N | 0-10 cm | | | | 2.16 | 1895 |
| 23BT1128 | 13W/28N | 0-10 cm | | | | 2.06 | 1886 |
| 23BT1128 | 13W/28N | 0-10 cm | | | | 1.89 | 1872 |
| 23BT1128 | 13W/28N | 0-10 cm | | | | 1.69 | 1855 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 3.77 | 2030 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 2.99 | 1965 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 2.82 | 1950 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 2.78 | 1947 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 2.7 | 1940 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 2.67 | 1938 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 2.66 | 1937 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 2.64 | 1935 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 2.62 | 1933 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 2.61 | 1933 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 2.6 | 1932 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 23BT1128 | 13W/28N | 10-20 cm | | | | 2.6 | 1932 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 2.59 | 1931 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 2.59 | 1931 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 2.59 | 1931 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 2.58 | 1930 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 2.56 | 1928 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 2.56 | 1928 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 2.55 | 1927 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 2.52 | 1925 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 2.48 | 1922 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 2.48 | 1922 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 2.34 | 1910 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 2.31 | 1907 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 2.25 | 1902 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 2.24 | 1901 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 2.22 | 1900 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 2.15 | 1894 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 2.14 | 1893 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 2.13 | 1892 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 2.12 | 1891 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 2.12 | 1891 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 2.11 | 1890 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 2.09 | 1889 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 2.06 | 1886 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 2.04 | 1885 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 2.04 | 1885 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 2.04 | 1885 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 2.03 | 1884 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 2.03 | 1884 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 2.03 | 1884 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 2.03 | 1884 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 2.01 | 1882 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 2.01 | 1882 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 1.99 | 1880 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 1.98 | 1879 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 1.98 | 1879 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 1.98 | 1879 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 1.97 | 1879 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 1.96 | 1878 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 1.96 | 1878 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 1.96 | 1878 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 1.95 | 1877 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 1.93 | 1875 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 1.93 | 1875 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 1.92 | 1874 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 1.92 | 1874 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 1.88 | 1871 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 1.87 | 1870 |

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|---|---|---|---|---|---|---|---|
| 23BT1128 | 13W/28N | 10-20 cm | | | | 1.81 | 1865 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 1.77 | 1862 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 1.76 | 1861 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 1.76 | 1861 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 1.74 | 1859 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 1.74 | 1859 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 1.71 | 1857 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 1.7 | 1856 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 1.62 | 1849 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 1.54 | 1842 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 1.53 | 1842 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 1.53 | 1842 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 1.48 | 1837 |
| 23BT1128 | 13W/28N | 10-20 cm | | | | 1.07 | 1803 |
| 23BT1128 | 13W/28N | 20-30 cm | | | | 2.73 | 1943 |
| 23BT1128 | 13W/28N | 20-30 cm | | | | 2.34 | 1910 |
| 23BT1128 | 13W/28N | 20-30 cm | | | | 2.3 | 1906 |
| 23BT1128 | 13W/28N | 20-30 cm | | | | 2.15 | 1894 |
| 23BT1128 | 13W/28N | 20-30 cm | | | | 1.65 | 1852 |
| 23BT1128 | 13W/28N | 20-30 cm | | | | 1.56 | 1844 |
| 23BT1128 | 13W/28N | 20-30 cm | | | | 1.48 | 1837 |
| 23BT1128 | 15W/28N | 10-20 cm | | | | 2.71 | 1941 |
| 23BT1128 | 15W/28N | 10-20 cm | | | | 2.65 | 1936 |
| 23BT1128 | 15W/28N | 10-20 cm | | | | 2.47 | 1921 |
| 23BT1128 | 15W/28N | 10-20 cm | | | | 2.43 | 1917 |
| 23BT1128 | 15W/28N | 10-20 cm | | | | 2.42 | 1917 |
| 23BT1128 | 15W/28N | 10-20 cm | | | | 2.37 | 1912 |
| 23BT1128 | 15W/28N | 10-20 cm | | | | 2.36 | 1911 |
| 23BT1128 | 15W/28N | 10-20 cm | | | | 2.34 | 1910 |
| 23BT1128 | 15W/28N | 10-20 cm | | | | 2.32 | 1908 |
| 23BT1128 | 15W/28N | 10-20 cm | | | | 2.29 | 1906 |
| 23BT1128 | 15W/28N | 10-20 cm | | | | 2.22 | 1900 |
| 23BT1128 | 15W/28N | 10-20 cm | | | | 2.15 | 1894 |
| 23BT1128 | 15W/28N | 10-20 cm | | | | 2.05 | 1885 |
| 23BT1128 | 15W/28N | 10-20 cm | | | | 1.99 | 1880 |
| 23BT1128 | 15W/28N | 10-20 cm | | | | 1.96 | 1878 |
| 23BT1128 | 15W/28N | 10-20 cm | | | | 1.94 | 1876 |
| 23BT1128 | 15W/28N | 10-20 cm | | | | 1.93 | 1875 |
| 23BT1128 | 15W/28N | 10-20 cm | | | | 1.93 | 1875 |
| 23BT1128 | 15W/28N | 10-20 cm | | | | 1.91 | 1874 |
| 23BT1128 | 15W/28N | 10-20 cm | | | | 1.88 | 1871 |
| 23BT1128 | 15W/28N | 10-20 cm | | | | 1.87 | 1870 |
| 23BT1128 | 15W/28N | 10-20 cm | | | | 1.79 | 1863 |
| 23BT1128 | 15W/28N | 10-20 cm | | | | 1.79 | 1863 |
| 23BT1128 | 15W/28N | 10-20 cm | | | | 1.78 | 1863 |
| 23BT1128 | 15W/28N | 10-20 cm | | | | 1.72 | 1858 |
| 23BT1128 | 15W/28N | 10-20 cm | | | | 1.52 | 1841 |
| 23BT1128 | 15W/28N | 10-20 cm | | | | 1.52 | 1841 |

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|---|---|---|---|---|---|---|---|
| 23BT1128 | 15W/28N | 10-20 cm | | | | 1.5 | 1839 |
| 23BT1128 | 15W/28N | 10-20 cm | | | | 1.47 | 1837 |
| 23BT1128 | 15W/28N | 10-20 cm | | | | 1.45 | 1835 |
| 23BT1128 | 15W/28N | 10-20 cm | | | | 1.4 | 1831 |
| 23BT1128 | 15W/28N | 10-20 cm | | | | 1.39 | 1830 |
| 23BT1128 | 15W/28N | 10-20 cm | | | | 1.38 | 1829 |
| 23BT1128 | 15W/28N | 10-20 cm | | | | 1.33 | 1825 |
| 23BT1128 | 15W/28N | 10-20 cm | | | | 1.3 | 1822 |
| 23BT1128 | 15W/28N | 10-20 cm | | | | 1.28 | 1821 |
| 23BT1128 | 15W/28N | 10-20 cm | | | | 1.27 | 1820 |
| 23BT1128 | 15W/28N | 10-20 cm | | | | 1.21 | 1815 |
| 23BT1128 | 15W/28N | 10-20 cm | | | | 1.16 | 1810 |
| 23BT1128 | 15W/28N | 20-30 cm | | | | 2.69 | 1939 |
| 23BT1128 | 16.5W/28.5N | 0-10 cm | | | | 2.96 | 1962 |
| 23BT1128 | 16.5W/28.5N | 0-10 cm | | | | 2.88 | 1955 |
| 23BT1128 | 16.5W/28.5N | 0-10 cm | | | | 2.45 | 1919 |
| 23BT1128 | 16.5W/28.5N | 0-10 cm | | | | 2.27 | 1904 |
| 23BT1128 | 16.5W/28.5N | 0-10 cm | | | | 2.24 | 1901 |
| 23BT1128 | 16.5W/28.5N | 0-10 cm | | | | 2.15 | 1894 |
| 23BT1128 | 16.5W/28.5N | 0-10 cm | | | | 2.13 | 1892 |
| 23BT1128 | 16.5W/28.5N | 0-10 cm | | | | 1.99 | 1880 |
| 23BT1128 | 16.5W/28.5N | 0-10 cm | | | | 1.83 | 1867 |
| 23BT1128 | 16.5W/28.5N | 0-10 cm | | | | 1.8 | 1864 |
| 23BT1128 | 12W/29N | 0-10 cm | | | | 2.89 | 1956 |
| 23BT1128 | 12W/29N | 0-10 cm | | | | 2.67 | 1938 |
| 23BT1128 | 12W/29N | 0-10 cm | | | | 2.6 | 1932 |
| 23BT1128 | 12W/29N | 0-10 cm | | | | 2.56 | 1928 |
| 23BT1128 | 12W/29N | 0-10 cm | | | | 2.33 | 1909 |
| 23BT1128 | 12W/29N | 0-10 cm | | | | 2.31 | 1907 |
| 23BT1128 | 12W/29N | 0-10 cm | | | | 2.27 | 1904 |
| 23BT1128 | 12W/29N | 0-10 cm | | | | 2.22 | 1900 |
| 23BT1128 | 12W/29N | 0-10 cm | | | | 2.2 | 1898 |
| 23BT1128 | 12W/29N | 0-10 cm | | | | 2.15 | 1894 |
| 23BT1128 | 12W/29N | 0-10 cm | | | | 2.03 | 1884 |
| 23BT1128 | 12W/29N | 0-10 cm | | | | 2.03 | 1884 |
| 23BT1128 | 12W/29N | 0-10 cm | | | | 1.6 | 1847 |
| 23BT1128 | 12W/29N | 0-10 cm | | | | 1.56 | 1844 |
| 23BT1128 | 12W/29N | 10-20 cm | | | | 2.98 | 1964 |
| 23BT1128 | 12W/29N | 10-20 cm | | | | 2.62 | 1933 |
| 23BT1128 | 12W/29N | 10-20 cm | | | | 2.61 | 1933 |
| 23BT1128 | 12W/29N | 10-20 cm | | | | 2.43 | 1917 |
| 23BT1128 | 12W/29N | 10-20 cm | | | | 2.39 | 1914 |
| 23BT1128 | 12W/29N | 10-20 cm | | | | 2.36 | 1911 |
| 23BT1128 | 12W/29N | 10-20 cm | | | | 2.29 | 1906 |
| 23BT1128 | 12W/29N | 10-20 cm | | | | 2.24 | 1901 |
| 23BT1128 | 12W/29N | 10-20 cm | | | | 2.23 | 1901 |
| 23BT1128 | 12W/29N | 10-20 cm | | | | 2.21 | 1899 |
| 23BT1128 | 12W/29N | 10-20 cm | | | | 2.19 | 1897 |

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|---|---|---|---|---|---|---|---|
| 23BT1128 | 12W/29N | 10-20 cm | | | | 2.18 | 1896 |
| 23BT1128 | 12W/29N | 10-20 cm | | | | 2.16 | 1895 |
| 23BT1128 | 12W/29N | 10-20 cm | | | | 2.13 | 1892 |
| 23BT1128 | 12W/29N | 10-20 cm | | | | 2.11 | 1890 |
| 23BT1128 | 12W/29N | 10-20 cm | | | | 1.99 | 1880 |
| 23BT1128 | 12W/29N | 10-20 cm | | | | 1.99 | 1880 |
| 23BT1128 | 12W/29N | 10-20 cm | | | | 1.94 | 1876 |
| 23BT1128 | 12W/29N | 10-20 cm | | | | 1.9 | 1873 |
| 23BT1128 | 12W/29N | 10-20 cm | | | | 1.83 | 1867 |
| 23BT1128 | 12W/29N | 10-20 cm | | | | 1.77 | 1862 |
| 23BT1128 | 12W/29N | 10-20 cm | | | | 1.73 | 1858 |
| 23BT1128 | 12W/29N | 10-20 cm | | | | 1.7 | 1856 |
| 23BT1128 | 12W/29N | 10-20 cm | | | | 1.63 | 1850 |
| 23BT1128 | 12W/29N | 10-20 cm | | | | 1.58 | 1846 |
| 23BT1128 | 12W/29N | 10-20 cm | | | | 1.57 | 1845 |
| 23BT1128 | 12W/29N | 10-20 cm | | | | 1.53 | 1842 |
| 23BT1128 | 12W/29N | 10-20 cm | | | | 1.51 | 1840 |
| 23BT1128 | 12W/29N | 10-20 cm | | | | 1.5 | 1839 |
| 23BT1128 | 12W/29N | 10-20 cm | | | | 1.49 | 1838 |
| 23BT1128 | 12W/29N | 10-20 cm | | | | 0.8 | 1780 |
| 23BT1128 | 12W/29N | 20-30 cm | | | | 3.03 | 1968 |
| 23BT1128 | 12W/29N | 20-30 cm | | | | 2.94 | 1960 |
| 23BT1128 | 12W/29N | 20-30 cm | | | | 2.66 | 1937 |
| 23BT1128 | 12W/29N | 20-30 cm | | | | 2.36 | 1911 |
| 23BT1128 | 12W/29N | 20-30 cm | | | | 2.31 | 1907 |
| 23BT1128 | 12W/29N | 20-30 cm | | | | 2.2 | 1898 |
| 23BT1128 | 12W/29N | 20-30 cm | | | | 1.87 | 1870 |
| 23BT1128 | 12W/29N | 20-30 cm | | | | 1.85 | 1869 |
| 23BT1128 | 12W/29N | 20-30 cm | | | | 1.82 | 1866 |
| 23BT1128 | 10W/32N | 0-10 cm | | | | 3.06 | 1970 |
| 23BT1128 | 10W/32N | 0-10 cm | | | | 3.01 | 1966 |
| 23BT1128 | 10W/32N | 0-10 cm | | | | 2.9 | 1957 |
| 23BT1128 | 10W/32N | 0-10 cm | | | | 2.89 | 1956 |
| 23BT1128 | 10W/32N | 0-10 cm | | | | 2.88 | 1955 |
| 23BT1128 | 10W/32N | 0-10 cm | | | | 2.85 | 1953 |
| 23BT1128 | 10W/32N | 0-10 cm | | | | 2.53 | 1926 |
| 23BT1128 | 10W/32N | 0-10 cm | | | | 2.47 | 1921 |
| 23BT1128 | 10W/32N | 0-10 cm | | | | 2.44 | 1918 |
| 23BT1128 | 10W/32N | 0-10 cm | | | | 2.21 | 1899 |
| 23BT1128 | 10W/32N | 0-10 cm | | | | 2.11 | 1890 |
| 23BT1128 | 10W/32N | 0-10 cm | | | | 2.11 | 1890 |
| 23BT1128 | 10W/32N | 0-10 cm | | | | 2.05 | 1885 |
| 23BT1128 | 10W/32N | 0-10 cm | | | | 1.96 | 1878 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 2.98 | 1964 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 2.77 | 1946 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 2.17 | 1895 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 2.14 | 1893 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.9 | 1873 |

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|---|---|---|---|---|---|---|---|
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.89 | 1872 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.88 | 1871 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.87 | 1870 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.87 | 1870 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.87 | 1870 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.87 | 1870 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.86 | 1869 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.86 | 1869 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.86 | 1869 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.86 | 1869 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.86 | 1869 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.86 | 1869 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.85 | 1869 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.85 | 1869 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.85 | 1869 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.85 | 1869 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.85 | 1869 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.85 | 1869 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.85 | 1869 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.85 | 1869 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.85 | 1869 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.85 | 1869 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.84 | 1868 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.84 | 1868 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.84 | 1868 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.84 | 1868 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.84 | 1868 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.84 | 1868 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.84 | 1868 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.84 | 1868 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.84 | 1868 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.84 | 1868 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.84 | 1868 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.83 | 1867 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.83 | 1867 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.83 | 1867 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.83 | 1867 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.83 | 1867 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.83 | 1867 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.83 | 1867 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.83 | 1867 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.82 | 1866 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.82 | 1866 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.82 | 1866 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.82 | 1866 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.82 | 1866 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.82 | 1866 |

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|---|---|---|---|---|---|---|---|
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.82 | 1866 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.82 | 1866 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.82 | 1866 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.82 | 1866 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.82 | 1866 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.82 | 1866 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.82 | 1866 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.82 | 1866 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.81 | 1865 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.81 | 1865 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.81 | 1865 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.81 | 1865 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.81 | 1865 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.81 | 1865 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.8 | 1864 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.8 | 1864 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.79 | 1863 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.79 | 1863 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.79 | 1863 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.79 | 1863 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.78 | 1863 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.78 | 1863 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.78 | 1863 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.76 | 1861 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.76 | 1861 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.76 | 1861 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.74 | 1859 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.74 | 1859 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.73 | 1858 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.72 | 1858 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.71 | 1857 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.71 | 1857 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.7 | 1856 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.69 | 1855 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.69 | 1855 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.68 | 1854 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.67 | 1853 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.64 | 1851 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.62 | 1849 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.62 | 1849 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.55 | 1843 |
| 23BT1128 | 13W/32N | 0-10 cm | | | | 1.31 | 1823 |
| 23BT1128 | 13W/32N | 10-20 cm | | | | 2.57 | 1929 |
| 23BT1128 | 13W/32N | 10-20 cm | | | | 2.49 | 1922 |
| 23BT1128 | 13W/32N | 10-20 cm | | | | 2.29 | 1906 |
| 23BT1128 | 13W/32N | 10-20 cm | | | | 2.29 | 1906 |
| 23BT1128 | 13W/32N | 10-20 cm | | | | 2.15 | 1894 |
| 23BT1128 | 13W/32N | 10-20 cm | | | | 2.12 | 1891 |

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|---|---|---|---|---|---|---|---|
| 23BT1128 | 13W/32N | 10-20 cm | | | | 2.07 | 1887 |
| 23BT1128 | 13W/32N | 10-20 cm | | | | 2.04 | 1885 |
| 23BT1128 | 13W/32N | 10-20 cm | | | | 1.89 | 1872 |
| 23BT1128 | 13W/32N | 10-20 cm | | | | 1.81 | 1865 |
| 23BT1128 | 13W/32N | 10-20 cm | | | | 1.72 | 1858 |
| 23BT1128 | 13W/32N | 10-20 cm | | | | 1.7 | 1856 |
| 23BT1128 | 13W/32N | 10-20 cm | | | | 1.68 | 1854 |
| 23BT1128 | 13W/32N | 10-20 cm | | | | 1.64 | 1851 |
| 23BT1128 | 13W/32N | 10-20 cm | | | | 1.63 | 1850 |
| 23BT1128 | 13W/32N | 10-20 cm | | | | 1.62 | 1849 |
| 23BT1128 | 13W/32N | 10-20 cm | | | | 1.61 | 1848 |
| 23BT1128 | 13W/32N | 10-20 cm | | | | 1.58 | 1846 |
| 23BT1128 | 13W/32N | 10-20 cm | | | | 1.58 | 1846 |
| 23BT1128 | 13W/32N | 10-20 cm | | | | 1.58 | 1846 |
| 23BT1128 | 13W/32N | 10-20 cm | | | | 1.57 | 1845 |
| 23BT1128 | 13W/32N | 10-20 cm | | | | 1.56 | 1844 |
| 23BT1128 | 13W/32N | 10-20 cm | | | | 1.56 | 1844 |
| 23BT1128 | 13W/32N | 10-20 cm | | | | 1.56 | 1844 |
| 23BT1128 | 13W/32N | 10-20 cm | | | | 1.54 | 1842 |
| 23BT1128 | 13W/32N | 10-20 cm | | | | 1.53 | 1842 |
| 23BT1128 | 13W/32N | 10-20 cm | | | | 1.53 | 1842 |
| 23BT1128 | 13W/32N | 10-20 cm | | | | 1.53 | 1842 |
| 23BT1128 | 13W/32N | 10-20 cm | | | | 1.53 | 1842 |
| 23BT1128 | 13W/32N | 10-20 cm | | | | 1.53 | 1842 |
| 23BT1128 | 13W/32N | 10-20 cm | | | | 1.53 | 1842 |
| 23BT1128 | 13W/32N | 10-20 cm | | | | 1.52 | 1841 |
| 23BT1128 | 13W/32N | 10-20 cm | | | | 1.52 | 1841 |
| 23BT1128 | 13W/32N | 10-20 cm | | | | 1.52 | 1841 |
| 23BT1128 | 13W/32N | 10-20 cm | | | | 1.52 | 1841 |
| 23BT1128 | 13W/32N | 10-20 cm | | | | 1.51 | 1840 |
| 23BT1128 | 13W/32N | 10-20 cm | | | | 1.51 | 1840 |
| 23BT1128 | 13W/32N | 10-20 cm | | | | 1.51 | 1840 |
| 23BT1128 | 13W/32N | 10-20 cm | | | | 1.5 | 1839 |
| 23BT1128 | 13W/32N | 10-20 cm | | | | 1.5 | 1839 |
| 23BT1128 | 13W/32N | 10-20 cm | | | | 1.5 | 1839 |
| 23BT1128 | 13W/32N | 10-20 cm | | | | 1.5 | 1839 |
| 23BT1128 | 13W/32N | 10-20 cm | | | | 1.48 | 1837 |
| 23BT1128 | 13W/32N | 10-20 cm | | | | 1.48 | 1837 |
| 23BT1128 | 13W/32N | 10-20 cm | | | | 1.48 | 1837 |
| 23BT1128 | 13W/32N | 10-20 cm | | | | 1.48 | 1837 |
| 23BT1128 | 13W/32N | 10-20 cm | | | | 1.48 | 1837 |
| 23BT1128 | 13W/32N | 10-20 cm | | | | 1.47 | 1837 |
| 23BT1128 | 13W/32N | 10-20 cm | | | | 1.47 | 1837 |
| 23BT1128 | 13W/32N | 10-20 cm | | | | 1.46 | 1836 |
| 23BT1128 | 13W/32N | 10-20 cm | | | | 1.45 | 1835 |
| 23BT1128 | 13W/32N | 10-20 cm | | | | 1.44 | 1834 |
| 23BT1128 | 13W/32N | 10-20 cm | | | | 1.44 | 1834 |
| 23BT1128 | 13W/32N | 10-20 cm | | | | 1.33 | 1825 |

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|---|---|---|---|---|---|---|---|
| 23BT1128 | 13W/32N | 10-20 cm | | | | 1.32 | 1824 |
| 23BT1128 | 13W/32N | 10-20 cm | | | | 0.79 | 1779 |
| 23BT1128 | 14W/32N | 0-10 cm | | | | 2.76 | 1945 |
| 23BT1128 | 14W/32N | 0-10 cm | | | | 2.64 | 1935 |
| 23BT1128 | 14W/32N | 0-10 cm | | | | 2.63 | 1934 |
| 23BT1128 | 14W/32N | 0-10 cm | | | | 2.63 | 1934 |
| 23BT1128 | 14W/32N | 0-10 cm | | | | 2.62 | 1933 |
| 23BT1128 | 14W/32N | 0-10 cm | | | | 2.61 | 1933 |
| 23BT1128 | 14W/32N | 0-10 cm | | | | 2.3 | 1906 |
| 23BT1128 | 14W/32N | 0-10 cm | | | | 2.29 | 1906 |
| 23BT1128 | 14W/32N | 0-10 cm | | | | 2.23 | 1901 |
| 23BT1128 | 14W/32N | 0-10 cm | | | | 2.18 | 1896 |
| 23BT1128 | 14W/32N | 0-10 cm | | | | 2.17 | 1895 |
| 23BT1128 | 14W/32N | 0-10 cm | | | | 1.93 | 1875 |
| 23BT1128 | 14W/32N | 0-10 cm | | | | 1.92 | 1874 |
| 23BT1128 | 14W/32N | 0-10 cm | | | | 1.9 | 1873 |
| 23BT1128 | 14W/32N | 0-10 cm | | | | 1.88 | 1871 |
| 23BT1128 | 14W/32N | 0-10 cm | | | | 1.86 | 1869 |
| 23BT1128 | 14W/32N | 0-10 cm | | | | 1.86 | 1869 |
| 23BT1128 | 14W/32N | 0-10 cm | | | | 1.85 | 1869 |
| 23BT1128 | 14W/32N | 0-10 cm | | | | 1.79 | 1863 |
| 23BT1128 | 14W/32N | 0-10 cm | | | | 1.79 | 1863 |
| 23BT1128 | 14W/32N | 0-10 cm | | | | 1.79 | 1863 |
| 23BT1128 | 14W/32N | 10-20 cm | | | | 3.07 | 1971 |
| 23BT1128 | 14W/32N | 10-20 cm | | | | 3.05 | 1970 |
| 23BT1128 | 14W/32N | 10-20 cm | | | | 3.04 | 1969 |
| 23BT1128 | 14W/32N | 10-20 cm | | | | 3 | 1965 |
| 23BT1128 | 14W/32N | 10-20 cm | | | | 2.87 | 1954 |
| 23BT1128 | 14W/32N | 10-20 cm | | | | 2.72 | 1942 |
| 23BT1128 | 14W/32N | 10-20 cm | | | | 2.62 | 1933 |
| 23BT1128 | 14W/32N | 10-20 cm | | | | 2.61 | 1933 |
| 23BT1128 | 14W/32N | 10-20 cm | | | | 2.6 | 1932 |
| 23BT1128 | 14W/32N | 10-20 cm | | | | 2.59 | 1931 |
| 23BT1128 | 14W/32N | 10-20 cm | | | | 2.57 | 1929 |
| 23BT1128 | 14W/32N | 10-20 cm | | | | 2.5 | 1923 |
| 23BT1128 | 14W/32N | 10-20 cm | | | | 2.46 | 1920 |
| 23BT1128 | 14W/32N | 10-20 cm | | | | 2.4 | 1915 |
| 23BT1128 | 14W/32N | 10-20 cm | | | | 2.34 | 1910 |
| 23BT1128 | 14W/32N | 10-20 cm | | | | 2.3 | 1906 |
| 23BT1128 | 14W/32N | 10-20 cm | | | | 2.29 | 1906 |
| 23BT1128 | 14W/32N | 10-20 cm | | | | 2.23 | 1901 |
| 23BT1128 | 14W/32N | 10-20 cm | | | | 2.22 | 1900 |
| 23BT1128 | 14W/32N | 10-20 cm | | | | 2.2 | 1898 |
| 23BT1128 | 14W/32N | 10-20 cm | | | | 2.17 | 1895 |
| 23BT1128 | 14W/32N | 10-20 cm | | | | 2.15 | 1894 |
| 23BT1128 | 14W/32N | 10-20 cm | | | | 2.14 | 1893 |
| 23BT1128 | 14W/32N | 10-20 cm | | | | 2.13 | 1892 |
| 23BT1128 | 14W/32N | 10-20 cm | | | | 2.1 | 1890 |

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|---|---|---|---|---|---|---|---|
| 23BT1128 | 14W/32N | 10-20 cm | | | | 2.1 | 1890 |
| 23BT1128 | 14W/32N | 10-20 cm | | | | 2.04 | 1885 |
| 23BT1128 | 14W/32N | 10-20 cm | | | | 2.03 | 1884 |
| 23BT1128 | 14W/32N | 10-20 cm | | | | 1.92 | 1874 |
| 23BT1128 | 14W/32N | 10-20 cm | | | | 1.88 | 1871 |
| 23BT1128 | 14W/32N | 10-20 cm | | | | 1.87 | 1870 |
| 23BT1128 | 14W/32N | 10-20 cm | | | | 1.87 | 1870 |
| 23BT1128 | 14W/32N | 10-20 cm | | | | 1.86 | 1869 |
| 23BT1128 | 14W/32N | 10-20 cm | | | | 1.86 | 1869 |
| 23BT1128 | 14W/32N | 10-20 cm | | | | 1.83 | 1867 |
| 23BT1128 | 14W/32N | 10-20 cm | | | | 1.83 | 1867 |
| 23BT1128 | 14W/32N | 10-20 cm | | | | 1.81 | 1865 |
| 23BT1128 | 14W/32N | 10-20 cm | | | | 1.8 | 1864 |
| 23BT1128 | 14W/32N | 10-20 cm | | | | 1.8 | 1864 |
| 23BT1128 | 14W/32N | 10-20 cm | | | | 1.75 | 1860 |
| 23BT1128 | 14W/32N | 10-20 cm | | | | 1.75 | 1860 |
| 23BT1128 | 14W/32N | 10-20 cm | | | | 1.73 | 1858 |
| 23BT1128 | 14W/32N | 10-20 cm | | | | 1.65 | 1852 |
| 23BT1128 | 14W/32N | 10-20 cm | | | | 1.6 | 1847 |
| 23BT1128 | 13W/33N | 0-10 cm | | | | 2.36 | 1911 |
| 23BT1128 | 13W/33N | 0-10 cm | | | | 2.25 | 1902 |
| 23BT1128 | 13W/33N | 0-10 cm | | | | 2.21 | 1899 |
| 23BT1128 | 13W/33N | 0-10 cm | | | | 2.21 | 1899 |
| 23BT1128 | 13W/33N | 0-10 cm | | | | 2.2 | 1898 |
| 23BT1128 | 13W/33N | 0-10 cm | | | | 2.19 | 1897 |
| 23BT1128 | 13W/33N | 0-10 cm | | | | 2.19 | 1897 |
| 23BT1128 | 13W/33N | 0-10 cm | | | | 2.19 | 1897 |
| 23BT1128 | 13W/33N | 0-10 cm | | | | 2.18 | 1896 |
| 23BT1128 | 13W/33N | 0-10 cm | | | | 2.06 | 1886 |
| 23BT1128 | 13W/33N | 0-10 cm | | | | 2.06 | 1886 |
| 23BT1128 | 13W/33N | 0-10 cm | | | | 2.05 | 1885 |
| 23BT1128 | 13W/33N | 0-10 cm | | | | 2.04 | 1885 |
| 23BT1128 | 13W/33N | 0-10 cm | | | | 2.03 | 1884 |
| 23BT1128 | 13W/33N | 0-10 cm | | | | 2.02 | 1883 |
| 23BT1128 | 13W/33N | 0-10 cm | | | | 2.02 | 1883 |
| 23BT1128 | 13W/33N | 0-10 cm | | | | 1.96 | 1878 |
| 23BT1128 | 13W/33N | 0-10 cm | | | | 1.9 | 1873 |
| 23BT1128 | 13W/33N | 0-10 cm | | | | 1.88 | 1871 |
| 23BT1128 | 13W/33N | 0-10 cm | | | | 1.87 | 1870 |
| 23BT1128 | 13W/33N | 0-10 cm | | | | 1.85 | 1869 |
| 23BT1128 | 13W/33N | 0-10 cm | | | | 1.85 | 1869 |
| 23BT1128 | 13W/33N | 0-10 cm | | | | 1.84 | 1868 |
| 23BT1128 | 13W/33N | 0-10 cm | | | | 1.83 | 1867 |
| 23BT1128 | 13W/33N | 0-10 cm | | | | 1.83 | 1867 |
| 23BT1128 | 13W/33N | 0-10 cm | | | | 1.79 | 1863 |
| 23BT1128 | 13W/33N | 0-10 cm | | | | 1.76 | 1861 |
| 23BT1128 | 13W/33N | 0-10 cm | | | | 1.76 | 1861 |
| 23BT1128 | 13W/33N | 0-10 cm | | | | 1.75 | 1860 |

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|---|---|---|---|---|---|---|---|
| 23BT1128 | 13W/33N | 0-10 cm | | | | 1.74 | 1859 |
| 23BT1128 | 13W/33N | 0-10 cm | | | | 1.72 | 1858 |
| 23BT1128 | 13W/33N | 0-10 cm | | | | 1.67 | 1853 |
| 23BT1128 | 13W/33N | 0-10 cm | | | | 1.57 | 1845 |
| 23BT1128 | 13W/33N | 0-10 cm | | | | 1.57 | 1845 |
| 23BT1128 | 13W/33N | 0-10 cm | | | | 1.57 | 1845 |
| 23BT1128 | 13W/33N | 0-10 cm | | | | 1.55 | 1843 |
| 23BT1128 | 13W/33N | 0-10 cm | | | | 1.49 | 1838 |
| 23BT1128 | 12W/35N | 0-10 cm | | | | 2.33 | 1909 |
| 23BT1128 | 12W/35N | 0-10 cm | | | | 2.29 | 1906 |
| 23BT1128 | 12W/35N | 0-10 cm | | | | 2.23 | 1901 |
| 23BT1128 | 12W/35N | 0-10 cm | | | | 1.96 | 1878 |
| 23BT1128 | 12W/35N | 0-10 cm | | | | 1.35 | 1826 |
| 23BT1128 | 12W/35N | 0-10 cm | | | | 1.21 | 1815 |
| 23BT1128 | 12W/35N | 10-20 cm | | | | 2.24 | 1901 |
| 23BT1128 | 12W/35N | 10-20 cm | | | | 1.94 | 1876 |
| 23BT1128 | 12W/36.5N | 0-10 cm | | | | 2.74 | 1943 |
| 23BT1128 | 12W/36.5N | 0-10 cm | | | | 1.88 | 1871 |
| 23BT1128 | 12W/36.5N | 0-10 cm | | | | 1.8 | 1864 |
| 23BT1128 | 12W/36.5N | 0-10 cm | | | | 1.61 | 1848 |
| 23BT1128 | 12W/36.5N | 10-20 cm | | | | 2.34 | 1910 |
| 23BT1128 | Surface Survey | Surface | | | | 1.98 | 1879 |
| 23BT1128 | Surface Survey | Surface | | | | 1.97 | 1879 |
| 23BT1128 | Surface Survey | Surface | | | | 1.97 | 1879 |
| 23BT1128 | Surface Survey | Surface | | | | 1.93 | 1875 |
| 23BT1128 | Surface Survey | Surface | | | | 1.81 | 1865 |
| 23BT1128 | Auger #5 | 10-20 cm | | | | 2.23 | 1901 |
| 23BT1128 | Auger #5 | 10-20 cm | | | | 2.22 | 1900 |
| 23BT1128 | Auger #10 | 0-10 cm | | | | 2.08 | 1888 |
| 23BT1128 | Auger #10 | 10-20 cm | | | | 2.03 | 1884 |
| 23BT1128 | 16W/33N | 20-30 cm | 2.68 | 2.68 | 2.68 | 2.68 | 1938 |
| 23BT1128 | 12.5W/25N | 0-10 cm | 2.55 | 2.53 | 2.48 | 2.52 | 1925 |
| 23BT1128 | 15W/33N | 0-10 cm | 2.63 | 2.64 | 2.64 | 2.64 | 1935 |
| 23BT1128 | 14W/33N | 0-10 cm | 2.31 | 2.29 | 2.31 | 2.30 | 1907 |
| 23BT1128 | 15W/32N | 10-20 cm | 2.41 | 2.4 | 2.4 | 2.40 | 1915 |
| 23BT1128 | 15W/32N | 10-20 cm | 2.6 | 2.61 | 2.61 | 2.61 | 1932 |
| 23BT1128 | 15W/32N | 10-20 cm | 2.66 | 2.68 | 2.66 | 2.67 | 1937 |
| 23BT1128 | 15W/32N | 10-20 cm | 2.45 | 2.4 | 2.36 | 2.40 | 1915 |
| 23BT1128 | 16W/32N | 10-20 cm | 2.71 | 2.71 | 2.71 | 2.71 | 1941 |
| 23BT1128 | 16W/31N | 10-20 cm | 2.89 | 2.89 | 2.89 | 2.89 | 1956 |
| 23BT1128 | 16W/31N | 10-20 cm | 2.4 | 2.42 | 2.42 | 2.41 | 1916 |
| 23BT1128 | 11W/29N | 50-90 cm | 3.51 | 3.5 | 3.47 | 3.49 | 2007 |
| 23BT1128 | 12W/20.5N | 0-10 cm | 1.84 | 1.86 | 1.89 | 1.86 | 1870 |
| 23BT1128 | 15W/29N | 10-20 cm | 2.99 | 3.02 | 2.98 | 3.00 | 1965 |
| 23BT1128 | 15W/29N | 10-20 cm | 1.9 | 1.9 | 1.9 | 1.90 | 1873 |

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|---|---|---|---|---|---|---|---|
| 23BT1128 | 15W/29N | 10-20 cm | 1.94 | 1.91 | 1.89 | 1.91 | 1874 |
| 23BT1128 | 16W/33N | 10-20 cm | 2.52 | 2.56 | 2.57 | 2.55 | 1927 |
| 23BT1128 | 16W/33N | 10-20 cm | 2.46 | 2.46 | 2.45 | 2.46 | 1920 |
| 23BT1128 | 16W/33N | 10-20 cm | 2.54 | 2.55 | 2.53 | 2.54 | 1927 |
| 23BT1128 | 15W/33N | 20-30 cm | 2.39 | 2.39 | 2.36 | 2.38 | 1913 |
| 23BT1128 | 15W/33N | 20-30 cm | 2.19 | 2.2 | 2.22 | 2.20 | 1898 |
| 23BT1128 | 15W/33N | 10-20 cm | 2.23 | 2.24 | 2.24 | 2.24 | 1901 |
| 23BT1128 | 15W/33N | 10-20 cm | 1.42 | 1.42 | 1.43 | 1.42 | 1833 |
| 23BT1128 | 15W/33N | 10-20 cm | 2.54 | 2.55 | 2.55 | 2.55 | 1927 |
| 23BT1128 | 15W/33N | 10-20 cm | 2.11 | 2.12 | 2.12 | 2.12 | 1891 |
| 23BT1128 | 15W/33N | 10-20 cm | 2.53 | 2.54 | 2.55 | 2.54 | 1927 |
| 23BT1128 | 15W/33N | 10-20 cm | 2.47 | 2.47 | 2.45 | 2.46 | 1920 |
| 23BT1128 | 15W/33N | 10-20 cm | 2.1 | 2.1 | 2.1 | 2.10 | 1890 |
| 23BT1128 | 15W/33N | 10-20 cm | 2.33 | 2.35 | 2.37 | 2.35 | 1911 |
| 23BT1128 | 15W/33N | 10-20 cm | 2.24 | 2.25 | 2.23 | 2.24 | 1901 |
| 23BT1128 | 15W/33N | 10-20 cm | 2.4 | 2.36 | 2.32 | 2.36 | 1911 |
| 23BT1128 | 15W/33N | 10-20 cm | 2.38 | 2.39 | 2.39 | 2.39 | 1914 |
| 23BT1128 | 15W/33N | 10-20 cm | 2.35 | 2.37 | 2.38 | 2.37 | 1912 |
| 23BT1128 | 15W/33N | 10-20 cm | 1.93 | 1.96 | 1.97 | 1.95 | 1877 |
| 23BT1128 | 15W/33N | 10-20 cm | 2.45 | 2.44 | 2.42 | 2.44 | 1918 |
| 23BT1128 | 15W/33N | 10-20 cm | 2.86 | 2.85 | 2.82 | 2.84 | 1952 |
| 23BT1128 | 15W/33N | 10-20 cm | 2.52 | 2.52 | 2.51 | 2.52 | 1925 |
| 23BT1128 | 15W/32N | 10-20 cm | 2.58 | 2.61 | 2.64 | 2.61 | 1933 |
| 23BT1128 | 15W/32N | 10-20 cm | 1.85 | 1.88 | 1.87 | 1.87 | 1870 |
| 23BT1128 | 15W/32N | 10-20 cm | 1.84 | 1.84 | 1.85 | 1.84 | 1868 |
| 23BT1128 | 15W/32N | 10-20 cm | 3.09 | 3.09 | 3.07 | 3.08 | 1972 |
| 23BT1128 | 15W/32N | 10-20 cm | 3.14 | 3.1 | 3.13 | 3.12 | 1976 |
| 23BT1128 | 15W/32N | 10-20 cm | 2.35 | 2.32 | 2.25 | 2.31 | 1907 |
| 23BT1128 | 15W/32N | 10-20 cm | 3.04 | 3.03 | 3.02 | 3.03 | 1968 |
| 23BT1128 | 15W/32N | 10-20 cm | 2.31 | 2.31 | 2.31 | 2.31 | 1907 |
| 23BT1128 | 15W/32N | 10-20 cm | 1.83 | 1.85 | 1.87 | 1.85 | 1869 |
| 23BT1128 | 15W/32N | 10-20 cm | 2.43 | 2.44 | 2.44 | 2.44 | 1918 |
| 23BT1128 | 15W/32N | 10-20 cm | 2.44 | 2.49 | 2.54 | 2.49 | 1922 |
| 23BT1128 | 15W/32N | 10-20 cm | 1.76 | 1.77 | 1.76 | 1.76 | 1861 |
| 23BT1128 | 15W/32N | 10-20 cm | 1.86 | 1.86 | 1.84 | 1.85 | 1869 |
| 23BT1128 | 15W/32N | 10-20 cm | 1.77 | 1.78 | 1.78 | 1.78 | 1862 |
| 23BT1128 | 15W/32N | 10-20 cm | 2.39 | 2.43 | 2.44 | 2.42 | 1917 |
| 23BT1128 | 15W/32N | 10-20 cm | 3.08 | 3.06 | 3.04 | 3.06 | 1970 |
| 23BT1128 | 15W/32N | 10-20 cm | 2.59 | 2.59 | 2.59 | 2.59 | 1931 |
| 23BT1128 | 15W/32N | 10-20 cm | 3.04 | 3.04 | 3.05 | 3.04 | 1969 |
| 23BT1128 | 15W/32N | 10-20 cm | 3.08 | 3.1 | 3.12 | 3.10 | 1974 |
| 23BT1128 | 15W/32N | 10-20 cm | 2.59 | 2.57 | 2.57 | 2.58 | 1930 |
| 23BT1128 | 15W/32N | 10-20 cm | 2.59 | 2.57 | 2.59 | 2.58 | 1930 |
| 23BT1128 | 15W/31N | 10-20 cm | 2.41 | 2.39 | 2.42 | 2.41 | 1915 |
| 23BT1128 | 15W/31N | 10-20 cm | 2.34 | 2.38 | 2.41 | 2.38 | 1913 |
| 23BT1128 | 15W/31N | 10-20 cm | 1.94 | 1.9 | 1.9 | 1.91 | 1874 |
| 23BT1128 | 15W/31N | 10-20 cm | 3.03 | 3.03 | 3.01 | 3.02 | 1967 |
| 23BT1128 | 15W/31N | 10-20 cm | 3.17 | 3.2 | 3.23 | 3.20 | 1982 |

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|---|---|---|---|---|---|---|---|
| 23BT1128 | 15W/31N | 10-20 cm | 2.42 | 2.41 | 2.41 | 2.41 | 1916 |
| 23BT1128 | 15W/31N | 10-20 cm | 2.14 | 2.54 | 3.09 | 2.59 | 1931 |
| 23BT1128 | 15W/31N | 10-20 cm | 3.03 | 3.04 | 3.06 | 3.04 | 1969 |
| 23BT1128 | 15W/31N | 10-20 cm | 2.46 | 2.46 | 2.46 | 2.46 | 1920 |
| 23BT1128 | 15W/31N | 10-20 cm | 2.47 | 2.48 | 2.48 | 2.48 | 1921 |
| 23BT1128 | 15W/31N | 10-20 cm | 3.07 | 3.09 | 3.1 | 3.09 | 1973 |
| 23BT1128 | 15W/31N | 10-20 cm | 1.79 | 1.8 | 1.82 | 1.80 | 1865 |
| 23BT1128 | 15W/31N | 10-20 cm | 2.07 | 2.08 | 2.09 | 2.08 | 1888 |
| 23BT1128 | 15W/31N | 10-20 cm | 2.43 | 2.41 | 2.39 | 2.41 | 1916 |
| 23BT1128 | 14W/33N | 10-20 cm | 2.08 | 2.12 | 2.14 | 2.11 | 1891 |
| 23BT1128 | 14W/33N | 10-20 cm | 2.51 | 2.52 | 2.52 | 2.52 | 1925 |
| 23BT1128 | 14W/33N | 10-20 cm | 2.19 | 2.21 | 2.21 | 2.20 | 1898 |
| 23BT1128 | 14W/33N | 10-20 cm | 2.22 | 2.23 | 2.24 | 2.23 | 1901 |
| 23BT1128 | 14W/33N | 10-20 cm | 2.27 | 2.31 | 2.32 | 2.30 | 1906 |
| 23BT1128 | 14W/33N | 10-20 cm | 2.43 | 2.43 | 2.45 | 2.44 | 1918 |
| 23BT1128 | 14W/33N | 10-20 cm | 2.22 | 2.22 | 2.19 | 2.21 | 1899 |
| 23BT1128 | 14W/33N | 10-20 cm | 2.36 | 2.33 | 2.31 | 2.33 | 1909 |
| 23BT1128 | 14W/33N | 10-20 cm | 2.26 | 2.23 | 2.21 | 2.23 | 1901 |
| 23BT1128 | 14W/33N | 10-20 cm | 1.86 | 1.86 | 1.85 | 1.86 | 1869 |
| 23BT1128 | 14W/33N | 10-20 cm | 2.25 | 2.26 | 2.27 | 2.26 | 1903 |
| 23BT1128 | 14W/33N | 10-20 cm | 2.11 | 2.15 | 2.15 | 2.14 | 1893 |
| 23BT1128 | 14W/33N | 10-20 cm | 2.21 | 2.24 | 2.26 | 2.24 | 1901 |
| 23BT1128 | 14W/33N | 10-20 cm | 2.88 | 2.83 | 2.77 | 2.83 | 1951 |
| 23BT1128 | 14W/33N | 10-20 cm | 2.31 | 2.27 | 2.24 | 2.27 | 1904 |
| 23BT1128 | 14W/33N | 10-20 cm | 2.39 | 2.37 | 2.32 | 2.36 | 1911 |
| 23BT1128 | 14W/33N | 10-20 cm | 2.32 | 2.32 | 2.29 | 2.31 | 1907 |
| 23BT1128 | 14W/33N | 10-20 cm | 2.24 | 2.28 | 2.28 | 2.27 | 1904 |
| 23BT1128 | 14W/33N | 10-20 cm | 2.22 | 2.29 | 2.34 | 2.28 | 1905 |
| 23BT1128 | 14W/33N | 10-20 cm | 2.35 | 2.33 | 2.31 | 2.33 | 1909 |
| 23BT1128 | 14W/33N | 10-20 cm | 2.4 | 2.38 | 2.36 | 2.38 | 1913 |
| 23BT1128 | 14W/33N | 10-20 cm | 2.5 | 2.52 | 2.53 | 2.52 | 1925 |
| 23BT1128 | 14W/33N | 10-20 cm | 2 | 2.02 | 2.01 | 2.01 | 1882 |
| 23BT1128 | 14W/33N | 10-20 cm | 2.29 | 2.32 | 2.31 | 2.31 | 1907 |
| 23BT1128 | 14W/33N | 10-20 cm | 2.21 | 2.24 | 2.28 | 2.24 | 1902 |
| 23BT1128 | 14W/33N | 10-20 cm | 2.4 | 2.39 | 2.37 | 2.39 | 1914 |
| 23BT1128 | 14W/33N | 10-20 cm | 2.09 | 2.1 | 2.1 | 2.10 | 1889 |
| 23BT1128 | 14W/33N | 10-20 cm | 2.2 | 2.22 | 2.22 | 2.21 | 1899 |
| 23BT1128 | 14W/33N | 10-20 cm | 2.22 | 2.27 | 2.31 | 2.27 | 1904 |
| 23BT1128 | 14W/33N | 10-20 cm | 2.11 | 2.14 | 2.14 | 2.13 | 1892 |
| 23BT1128 | 15W/27N | 0-10 cm | 2.3 | 2.3 | 2.28 | 2.29 | 1906 |
| 23BT1128 | 15W/27N | 0-10 cm | 2.63 | 2.61 | 2.62 | 2.62 | 1933 |
| 23BT1128 | 15W/27N | 0-10 cm | 2.63 | 2.62 | 2.62 | 2.62 | 1934 |
| 23BT1128 | 15W/27N | 0-10 cm | 2.62 | 2.62 | 2.63 | 2.62 | 1934 |
| 23BT1128 | 15W/27N | 0-10 cm | 2.63 | 2.61 | 2.6 | 2.61 | 1933 |
| 23BT1128 | 15W/27N | 0-10 cm | 2.66 | 2.66 | 2.69 | 2.67 | 1938 |
| 23BT1128 | 15W/27N | 0-10 cm | 2.59 | 2.58 | 2.57 | 2.58 | 1930 |
| 23BT1128 | 15W/27N | 0-10 cm | 2.41 | 2.42 | 2.42 | 2.42 | 1916 |
| 23BT1128 | 15W/27N | 0-10 cm | 1.94 | 1.92 | 1.86 | 1.91 | 1873 |

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|---|---|---|---|---|---|---|---|
| 23BT1128 | 15W/27N | 0-10 cm | 2.3 | 2.28 | 2.29 | 2.29 | 1906 |
| 23BT1128 | 15W/27N | 0-10 cm | 2.52 | 2.53 | 2.55 | 2.53 | 1926 |
| 23BT1128 | 15W/27N | 0-10 cm | 2.6 | 2.59 | 2.56 | 2.58 | 1930 |
| 23BT1128 | 15W/27N | 0-10 cm | 1.69 | 1.7 | 1.72 | 1.70 | 1856 |
| 23BT1128 | 15W/27N | 0-10 cm | 2.72 | 2.74 | 2.76 | 2.74 | 1943 |
| 23BT1128 | 15W/27N | 0-10 cm | 2.01 | 2.03 | 2.08 | 2.04 | 1885 |
| 23BT1128 | 15W/27N | 0-10 cm | 2 | 2.03 | 2.08 | 2.04 | 1884 |
| 23BT1128 | 15W/27N | 0-10 cm | 2.28 | 2.26 | 2.2 | 2.25 | 1902 |
| 23BT1128 | 15W/27N | 0-10 cm | 2 | 2.03 | 1.99 | 2.01 | 1882 |
| 23BT1128 | 15W/27N | 0-10 cm | 2.28 | 2.29 | 2.29 | 2.29 | 1905 |
| 23BT1128 | 15W/27N | 0-10 cm | 2.1 | 2.11 | 2.15 | 2.12 | 1891 |
| 23BT1128 | 15W/27N | 0-10 cm | 2.29 | 2.29 | 2.29 | 2.29 | 1906 |
| 23BT1128 | 15W/27N | 0-10 cm | 2.53 | 2.54 | 2.51 | 2.53 | 1925 |
| 23BT1128 | 15W/27N | 0-10 cm | 2.26 | 2.28 | 2.27 | 2.27 | 1904 |
| 23BT1128 | 15W/27N | 0-10 cm | 2.49 | 2.32 | 2.23 | 2.35 | 1910 |
| 23BT1128 | 15W/26N | 10-20 cm | 2.23 | 2.23 | 2.41 | 2.29 | 1906 |
| 23BT1128 | 15W/26N | 10-20 cm | 1.98 | 2.01 | 2.01 | 2.00 | 1881 |
| 23BT1128 | 15W/26N | 10-20 cm | 2.56 | 2.55 | 2.53 | 2.55 | 1927 |
| 23BT1128 | 15W/26N | 10-20 cm | 2.35 | 2.38 | 2.42 | 2.38 | 1913 |
| 23BT1128 | 15W/26N | 10-20 cm | 2.19 | 2.18 | 2.18 | 2.18 | 1897 |
| 23BT1128 | 15W/26N | 10-20 cm | 2.22 | 2.19 | 2.16 | 2.19 | 1897 |
| 23BT1128 | 15W/26N | 10-20 cm | 2.54 | 2.51 | 2.51 | 2.52 | 1925 |
| 23BT1128 | 15W/26N | 10-20 cm | 2.15 | 2.16 | 2.16 | 2.16 | 1894 |
| 23BT1128 | 15W/26N | 10-20 cm | 2.44 | 2.44 | 2.43 | 2.44 | 1918 |
| 23BT1128 | 15W/26N | 10-20 cm | 2.43 | 2.44 | 2.44 | 2.44 | 1918 |
| 23BT1128 | 15W/26N | 10-20 cm | 2.25 | 2.24 | 2.21 | 2.23 | 1901 |
| 23BT1128 | 15W/26N | 10-20 cm | 2.3 | 2.29 | 2.28 | 2.29 | 1906 |
| 23BT1128 | 15W/26N | 10-20 cm | 2.2 | 2.19 | 2.2 | 2.20 | 1898 |
| 23BT1128 | 15W/26N | 10-20 cm | 2.58 | 2.57 | 2.56 | 2.57 | 1929 |
| 23BT1128 | 15W/26N | 10-20 cm | 1.94 | 1.95 | 1.97 | 1.95 | 1877 |
| 23BT1128 | 15W/26N | 10-20 cm | 2.15 | 2.15 | 2.16 | 2.15 | 1894 |
| 23BT1128 | 15W/26N | 10-20 cm | 2.17 | 2.16 | 2.17 | 2.17 | 1895 |
| 23BT1128 | 15W/26N | 10-20 cm | 2.5 | 2.5 | 2.48 | 2.49 | 1923 |
| 23BT1128 | 15W/26N | 10-20 cm | 2.22 | 2.24 | 2.23 | 2.23 | 1901 |
| 23BT1128 | 15W/26N | 10-20 cm | 2.22 | 2.23 | 2.22 | 2.22 | 1900 |
| 23BT1128 | 15W/26N | 10-20 cm | 1.99 | 2.06 | 2.12 | 2.06 | 1886 |
| 23BT1128 | 15W/26N | 10-20 cm | 3.04 | 3.04 | 3.03 | 3.04 | 1968 |
| 23BT1128 | 15W/26N | 10-20 cm | 2.6 | 2.61 | 2.63 | 2.61 | 1933 |
| 23BT1128 | 15W/26N | 10-20 cm | 2.15 | 2.17 | 2.19 | 2.17 | 1895 |
| 23BT1128 | 15W/26N | 10-20 cm | 2.46 | 2.49 | 2.5 | 2.48 | 1922 |
| 23BT1128 | 15W/26N | 10-20 cm | 2.57 | 2.57 | 2.56 | 2.57 | 1929 |
| 23BT1128 | 15W/26N | 10-20 cm | 2.37 | 2.36 | 2.3 | 2.34 | 1910 |
| 23BT1128 | 15W/26N | 10-20 cm | 2.62 | 2.7 | 2.73 | 2.68 | 1939 |
| 23BT1128 | 15W/26N | 10-20 cm | 1.69 | 1.68 | 1.68 | 1.68 | 1854 |
| 23BT1128 | 15W/26N | 0-10 cm | 3.09 | 3.07 | 3.06 | 3.07 | 1972 |
| 23BT1128 | 15W/26N | 0-10 cm | 2.55 | 2.53 | 2.5 | 2.53 | 1925 |
| 23BT1128 | 15W/26N | 0-10 cm | 3.2 | 3.18 | 3.14 | 3.17 | 1980 |
| 23BT1128 | 15W/26N | 0-10 cm | 3.11 | 3.13 | 3.16 | 3.13 | 1977 |

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|---|---|---|---|---|---|---|---|
| 23BT1128 | 15W/26N | 0-10 cm | 2.37 | 2.41 | 2.44 | 2.41 | 1915 |
| 23BT1128 | 15W/26N | 0-10 cm | 3.01 | 3.04 | 3.06 | 3.04 | 1968 |
| 23BT1128 | 15W/26N | 0-10 cm | 2.18 | 2.23 | 2.25 | 2.22 | 1900 |
| 23BT1128 | 15W/26N | 0-10 cm | 3.05 | 3.09 | 3.12 | 3.09 | 1973 |
| 23BT1128 | 15W/26N | 0-10 cm | 3.14 | 3.18 | 3.2 | 3.17 | 1980 |
| 23BT1128 | 15W/26N | 0-10 cm | 2.17 | 2.16 | 2.16 | 2.16 | 1895 |
| 23BT1128 | 15W/26N | 0-10 cm | 2.56 | 2.55 | 2.53 | 2.55 | 1927 |
| 23BT1128 | 15W/26N | 0-10 cm | 2.77 | 2.78 | 2.78 | 2.78 | 1947 |
| 23BT1128 | 15W/26N | 0-10 cm | 2.11 | 2.11 | 2.11 | 2.11 | 1890 |
| 23BT1128 | 15W/27N | 30-40 cm | 2.02 | 2.01 | 1.97 | 2.00 | 1881 |
| 23BT1128 | 15W/27N | 30-40 cm | 2.38 | 2.35 | 2.37 | 2.37 | 1912 |
| 23BT1128 | 15W/27N | 30-40 cm | 2.45 | 2.44 | 2.44 | 2.44 | 1918 |
| 23BT1128 | 15W/27N | 30-40 cm | 1.73 | 1.72 | 1.71 | 1.72 | 1858 |
| 23BT1128 | 15W/27N | 30-40 cm | 2.16 | 2.17 | 2.17 | 2.17 | 1895 |
| 23BT1128 | 15W/27N | 30-40 cm | 1.82 | 1.83 | 1.86 | 1.84 | 1867 |
| 23BT1128 | 15W/27N | 30-40 cm | 2.17 | 2.17 | 2.17 | 2.17 | 1895 |
| 23BT1128 | 15W/27N | 30-40 cm | 2.19 | 2.19 | 2.2 | 2.19 | 1897 |
| 23BT1128 | 15W/27N | 30-40 cm | 2.64 | 2.67 | 2.76 | 2.69 | 1939 |
| 23BT1128 | 15W/27N | 30-40 cm | 2.21 | 2.21 | 2.22 | 2.21 | 1899 |
| 23BT1128 | 15W/27N | 30-40 cm | 2.39 | 2.4 | 2.41 | 2.40 | 1915 |
| 23BT1128 | 15W/27N | 30-40 cm | 2.64 | 2.62 | 2.63 | 2.63 | 1934 |
| 23BT1128 | 15W/27N | 30-40 cm | 2.33 | 2.33 | 2.28 | 2.31 | 1908 |
| 23BT1128 | 15W/27N | 30-40 cm | 2.55 | 2.55 | 2.54 | 2.55 | 1927 |
| 23BT1128 | 15W/27N | 30-40 cm | 2.16 | 2.13 | 2.08 | 2.12 | 1892 |
| 23BT1128 | 15W/27N | 30-40 cm | 2.17 | 2.16 | 2.18 | 2.17 | 1895 |
| 23BT1128 | 15W/27N | 30-40 cm | 2.44 | 2.48 | 2.49 | 2.47 | 1921 |
| 23BT1128 | 15W/27N | 30-40 cm | 2.87 | 2.83 | 2.8 | 2.83 | 1951 |
| 23BT1128 | 15W/27N | 30-40 cm | 1.74 | 1.77 | 1.81 | 1.77 | 1862 |
| 23BT1128 | 15W/27N | 30-40 cm | 2.96 | 3.07 | 3.11 | 3.05 | 1969 |
| 23BT1128 | 15W/27N | 30-40 cm | 2.21 | 2.23 | 2.24 | 2.23 | 1900 |
| 23BT1128 | 15W/27N | 30-40 cm | 1.92 | 1.91 | 1.91 | 1.91 | 1874 |
| 23BT1128 | 15W/27N | 30-40 cm | 2.15 | 2.15 | 2.2 | 2.17 | 1895 |
| 23BT1128 | 15W/27N | 30-40 cm | 3.12 | 3.14 | 3.15 | 3.14 | 1977 |
| 23BT1128 | 15W/27N | 30-40 cm | 2.17 | 2.17 | 2.17 | 2.17 | 1895 |
| 23BT1128 | 15W/27N | 30-40 cm | 2.53 | 2.47 | 2.4 | 2.47 | 1920 |
| 23BT1128 | 15W/27N | 30-40 cm | 2.48 | 2.45 | 2.43 | 2.45 | 1919 |
| 23BT1128 | 15W/27N | 30-40 cm | 1.97 | 1.92 | 1.9 | 1.93 | 1875 |
| 23BT1128 | 15W/27N | 30-40 cm | 2.18 | 2.18 | 2.17 | 2.18 | 1896 |
| 23BT1128 | 15W/27N | 30-40 cm | 1.84 | 1.86 | 1.88 | 1.86 | 1869 |
| 23BT1128 | 15W/27N | 30-40 cm | 1.92 | 1.91 | 1.86 | 1.90 | 1872 |
| 23BT1128 | 15W/27N | 30-40 cm | 2.34 | 2.3 | 2.31 | 2.32 | 1908 |
| 23BT1128 | 15W/27N | 30-40 cm | 2.09 | 2.13 | 2.08 | 2.10 | 1890 |
| 23BT1128 | 15W/27N | 30-40 cm | 3.02 | 3.01 | 3.02 | 3.02 | 1967 |
| 23BT1128 | 15W/27N | 30-40 cm | 2.01 | 1.99 | 1.97 | 1.99 | 1880 |
| 23BT1128 | 15W/27N | 30-40 cm | 2.47 | 2.46 | 2.43 | 2.45 | 1919 |
| 23BT1128 | 15W/27N | 30-40 cm | 2 | 2 | 1.96 | 1.99 | 1880 |
| 23BT1128 | 15W/27N | 10-20 cm | 2.77 | 2.76 | 2.74 | 2.76 | 1945 |
| 23BT1128 | 15W/27N | 10-20 cm | 1.74 | 1.71 | 1.69 | 1.71 | 1857 |

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|---|---|---|---|---|---|---|---|
| 23BT1128 | 15W/27N | 10-20 cm | 2.36 | 2.35 | 2.34 | 2.35 | 1911 |
| 23BT1128 | 15W/27N | 10-20 cm | 2.31 | 2.33 | 2.4 | 2.35 | 1910 |
| 23BT1128 | 15W/27N | 10-20 cm | 2.18 | 2.15 | 2.11 | 2.15 | 1893 |
| 23BT1128 | 15W/27N | 10-20 cm | 2.26 | 2.21 | 2.17 | 2.21 | 1899 |
| 23BT1128 | 15W/27N | 10-20 cm | 2.26 | 2.2 | 2.15 | 2.20 | 1898 |
| 23BT1128 | 15W/27N | 10-20 cm | 2.38 | 2.37 | 2.31 | 2.35 | 1911 |
| 23BT1128 | 15W/27N | 10-20 cm | 2.29 | 2.28 | 2.29 | 2.29 | 1905 |
| 23BT1128 | 15W/27N | 10-20 cm | 2.24 | 2.27 | 2.28 | 2.26 | 1903 |
| 23BT1128 | 15W/27N | 10-20 cm | 2.37 | 2.35 | 2.35 | 2.36 | 1911 |
| 23BT1128 | 15W/27N | 10-20 cm | 2.39 | 2.33 | 2.29 | 2.34 | 1909 |
| 23BT1128 | 15W/27N | 10-20 cm | 2.63 | 2.63 | 2.65 | 2.64 | 1935 |
| 23BT1128 | 15W/27N | 10-20 cm | 2.88 | 2.88 | 2.89 | 2.88 | 1956 |
| 23BT1128 | 15W/27N | 10-20 cm | 2.38 | 2.38 | 2.37 | 2.38 | 1913 |
| 23BT1128 | 15W/27N | 10-20 cm | 2.31 | 2.39 | 2.44 | 2.38 | 1913 |
| 23BT1128 | 15W/27N | 10-20 cm | 2.5 | 2.73 | 2.93 | 2.72 | 1942 |
| 23BT1128 | 15W/27N | 10-20 cm | 2.65 | 2.65 | 2.64 | 2.65 | 1936 |
| 23BT1128 | 15W/27N | 10-20 cm | 2.49 | 2.45 | 2.43 | 2.46 | 1920 |
| 23BT1128 | 15W/27N | 10-20 cm | 2.49 | 2.49 | 2.43 | 2.47 | 1921 |
| 23BT1128 | 15W/27N | 10-20 cm | 2.48 | 2.48 | 2.48 | 2.48 | 1922 |
| 23BT1128 | 15W/27N | 10-20 cm | 2.11 | 2.09 | 2.04 | 2.08 | 1888 |
| 23BT1128 | 15W/27N | 10-20 cm | 2.21 | 2.23 | 2.25 | 2.23 | 1901 |
| 23BT1128 | 15W/27N | 10-20 cm | 1.94 | 2 | 2.01 | 1.98 | 1880 |
| 23BT1128 | 15W/27N | 10-20 cm | 2.33 | 2.28 | 2.26 | 2.29 | 1906 |
| 23BT1128 | 15W/27N | 10-20 cm | 2.61 | 2.64 | 2.63 | 2.63 | 1934 |
| 23BT1128 | 15W/27N | 10-20 cm | 2.64 | 2.63 | 2.63 | 2.63 | 1934 |
| 23BT1128 | 15W/27N | 10-20 cm | 2.34 | 2.35 | 2.35 | 2.35 | 1910 |
| 23BT1128 | 15W/27N | 10-20 cm | 2.13 | 2.11 | 2.08 | 2.11 | 1890 |
| 23BT1128 | 15W/27N | 10-20 cm | 2.39 | 2.62 | 2.59 | 2.53 | 1926 |
| 23BT1128 | 15W/27N | 10-20 cm | 1.69 | 1.69 | 1.66 | 1.68 | 1854 |
| 23BT1128 | 15W/27N | 10-20 cm | 2.37 | 2.41 | 2.43 | 2.40 | 1915 |
| 23BT1128 | 15W/27N | 10-20 cm | 2.07 | 2.06 | 2.05 | 2.06 | 1886 |
| 23BT1128 | 15W/27N | 10-20 cm | 2.5 | 2.61 | 2.63 | 2.58 | 1930 |
| 23BT1128 | 15W/27N | 10-20 cm | 2.19 | 2.18 | 2.17 | 2.18 | 1896 |
| 23BT1128 | 15W/27N | 10-20 cm | 2.25 | 2.27 | 2.29 | 2.27 | 1904 |
| 23BT1128 | 15W/27N | 10-20 cm | 2.86 | 2.84 | 2.82 | 2.84 | 1952 |
| 23BT1128 | 15W/27N | 10-20 cm | 2 | 2.01 | 2.02 | 2.01 | 1882 |
| 23BT1128 | 15W/27N | 10-20 cm | 2.3 | 2.29 | 2.28 | 2.29 | 1906 |
| 23BT1128 | 15W/27N | 10-20 cm | 2.09 | 2.11 | 2.13 | 2.11 | 1890 |
| 23BT1128 | 15W/27N | 10-20 cm | 2.24 | 2.26 | 2.29 | 2.26 | 1903 |
| 23BT1128 | 15W/27N | 10-20 cm | 2.05 | 2.04 | 2.01 | 2.03 | 1884 |
| 23BT1128 | 15W/27N | 10-20 cm | 1.68 | 1.68 | 1.69 | 1.68 | 1854 |
| 23BT1128 | 15W/27N | 10-20 cm | 2.14 | 2.15 | 2.16 | 2.15 | 1894 |
| 23BT1128 | 15W/27N | 10-20 cm | 2.37 | 2.36 | 2.34 | 2.36 | 1911 |
| 23BT1128 | 15W/27N | 10-20 cm | 3.14 | 3.43 | 3.7 | 3.42 | 2001 |
| 23BT1128 | 15W/27N | 10-20 cm | 1.88 | 1.96 | 2.04 | 1.96 | 1878 |
| 23BT1128 | 15W/27N | 10-20 cm | 2.52 | 2.54 | 2.52 | 2.53 | 1925 |
| 23BT1128 | 15W/27N | 10-20 cm | 2.01 | 2.05 | 2.04 | 2.03 | 1884 |
| 23BT1128 | 15W/27N | 10-20 cm | 2.17 | 2.15 | 2.1 | 2.14 | 1893 |

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|---|---|---|---|---|---|---|---|
| 23BT1128 | 15W/27N | 10-20 cm | 2.1 | 2.11 | 2.13 | 2.11 | 1891 |
| 23BT1128 | 15W/27N | 10-20 cm | 2.79 | 2.79 | 2.78 | 2.79 | 1947 |
| 23BT1128 | 15W/27N | 10-20 cm | 2.62 | 2.63 | 2.6 | 2.62 | 1933 |
| 23BT1128 | 15W/27N | 10-20 cm | 2.13 | 2.14 | 2.14 | 2.14 | 1893 |
| 23BT1128 | 15W/27N | 10-20 cm | 2.04 | 2.02 | 2.02 | 2.03 | 1883 |
| 23BT1128 | 15W/27N | 10-20 cm | 2.45 | 2.44 | 2.43 | 2.44 | 1918 |
| 23BT1128 | 15W/27N | 10-20 cm | 2.45 | 2.4 | 2.37 | 2.41 | 1915 |
| 23BT1128 | 15W/27N | 10-20 cm | 2.36 | 2.38 | 2.32 | 2.35 | 1911 |
| 23BT1128 | 15W/27N | 10-20 cm | 2.21 | 2.23 | 2.22 | 2.22 | 1900 |
| 23BT1128 | 15W/27N | 10-20 cm | 2.32 | 2.36 | 2.37 | 2.35 | 1911 |
| 23BT1128 | 15W/27N | 10-20 cm | 2.12 | 2.13 | 2.14 | 2.13 | 1892 |
| 23BT1128 | 15W/27N | 10-20 cm | 1.93 | 1.94 | 1.94 | 1.94 | 1876 |
| 23BT1128 | 15W/27N | 10-20 cm | 3.02 | 2.96 | 3.33 | 3.10 | 1974 |
| 23BT1128 | 15W/27N | 10-20 cm | 2.63 | 2.63 | 2.63 | 2.63 | 1934 |
| 23BT1128 | 15W/27N | 10-20 cm | 2.5 | 2.52 | 2.53 | 2.52 | 1925 |
| 23BT1128 | 15W/27N | 10-20 cm | 2.36 | 2.37 | 2.37 | 2.37 | 1912 |
| 23BT1128 | 15W/27N | 10-20 cm | 3.08 | 3.44 | 3.6 | 3.37 | 1997 |
| 23BT1128 | 15W/27N | 10-20 cm | 2.1 | 2.1 | 2.16 | 2.12 | 1891 |
| 23BT1128 | 15W/27N | 10-20 cm | 2.44 | 2.5 | 2.49 | 2.48 | 1921 |
| 23BT1128 | 15W/27N | 10-20 cm | 2.38 | 2.36 | 2.35 | 2.36 | 1912 |
| 23BT1128 | 15W/27N | 10-20 cm | 2.36 | 2.36 | 2.36 | 2.36 | 1911 |
| 23BT1128 | 15W/27N | 10-20 cm | 3.14 | 3.06 | 2.97 | 3.06 | 1970 |
| 23BT1128 | 15W/27N | 10-20 cm | 2.57 | 2.63 | 2.61 | 2.60 | 1932 |
| 23BT1128 | 15W/27N | 10-20 cm | 2.55 | 2.59 | 2.64 | 2.59 | 1931 |
| 23BT1128 | 15W/27N | 10-20 cm | 2.02 | 2.04 | 2.05 | 2.04 | 1884 |
| 23BT1128 | 15W/27N | 10-20 cm | 1.67 | 1.67 | 1.67 | 1.67 | 1853 |
| 23BT1128 | 15W/27N | 20-30 cm | 2.61 | 2.6 | 2.61 | 2.61 | 1932 |
| 23BT1128 | 15W/27N | 20-30 cm | 2.2 | 2.19 | 2.18 | 2.19 | 1897 |
| 23BT1128 | 15W/27N | 20-30 cm | 2.44 | 2.43 | 2.43 | 2.43 | 1918 |
| 23BT1128 | 15W/27N | 20-30 cm | 2.1 | 2.08 | 2.08 | 2.09 | 1888 |
| 23BT1128 | 15W/27N | 20-30 cm | 2.12 | 2.12 | 2.1 | 2.11 | 1891 |
| 23BT1128 | 15W/27N | 20-30 cm | 1.88 | 1.88 | 1.85 | 1.87 | 1870 |
| 23BT1128 | 15W/27N | 20-30 cm | 2.11 | 2.09 | 2.08 | 2.09 | 1889 |
| 23BT1128 | 15W/27N | 20-30 cm | 2.36 | 2.31 | 2.16 | 2.28 | 1904 |
| 23BT1128 | 15W/27N | 20-30 cm | 3.24 | 3.09 | 2.97 | 3.10 | 1974 |
| 23BT1128 | 15W/27N | 20-30 cm | 1.97 | 1.97 | 1.98 | 1.97 | 1879 |
| 23BT1128 | 15W/27N | 20-30 cm | 2.79 | 2.78 | 2.78 | 2.78 | 1947 |
| 23BT1128 | 15W/27N | 20-30 cm | 2.12 | 2.11 | 2.1 | 2.11 | 1890 |
| 23BT1128 | 15W/27N | 20-30 cm | 2.09 | 2.11 | 2.14 | 2.11 | 1891 |
| 23BT1128 | 15W/27N | 20-30 cm | 2.47 | 2.46 | 2.43 | 2.45 | 1919 |
| 23BT1128 | 15W/27N | 20-30 cm | 2.56 | 2.58 | 2.58 | 2.57 | 1929 |
| 23BT1128 | 15W/27N | 20-30 cm | 3.12 | 3.11 | 3.1 | 3.11 | 1975 |
| 23BT1128 | 15W/27N | 20-30 cm | 2.17 | 2.17 | 2.16 | 2.17 | 1895 |
| 23BT1128 | 15W/27N | 20-30 cm | 2.89 | 2.9 | 2.88 | 2.89 | 1956 |
| 23BT1128 | 15W/27N | 20-30 cm | 1.87 | 1.89 | 1.95 | 1.90 | 1873 |
| 23BT1128 | 15W/27N | 20-30 cm | 2.34 | 2.36 | 2.38 | 2.36 | 1911 |
| 23BT1128 | 15W/27N | 20-30 cm | 2.49 | 2.54 | 2.65 | 2.56 | 1928 |
| 23BT1128 | 15W/27N | 20-30 cm | 3.17 | 3.2 | 3.23 | 3.20 | 1982 |

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|---|---|---|---|---|---|---|---|
| 23BT1128 | 15W/27N | 20-30 cm | 2.23 | 2.25 | 2.26 | 2.25 | 1902 |
| 23BT1128 | 15W/27N | 20-30 cm | 3.02 | 3.02 | 3.02 | 3.02 | 1967 |
| 23BT1128 | 15W/27N | 20-30 cm | 2.46 | 2.45 | 2.44 | 2.45 | 1919 |
| 23BT1128 | 15W/27N | 20-30 cm | 3.01 | 3.02 | 3.03 | 3.02 | 1967 |
| 23BT1128 | 15W/27N | 20-30 cm | 2.57 | 2.63 | 2.68 | 2.63 | 1934 |
| 23BT1128 | 15W/27N | 20-30 cm | 1.98 | 2 | 1.99 | 1.99 | 1880 |
| 23BT1128 | 15W/27N | 20-30 cm | 1.78 | 1.76 | 1.78 | 1.77 | 1862 |
| 23BT1128 | 15W/27N | 20-30 cm | 1.94 | 1.9 | 1.88 | 1.91 | 1873 |
| 23BT1128 | 15W/27N | 20-30 cm | 1.74 | 1.77 | 1.8 | 1.77 | 1862 |
| 23BT1128 | 15W/27N | 20-30 cm | 2.1 | 2.09 | 2.12 | 2.10 | 1890 |
| 23BT1128 | 15W/27N | 20-30 cm | 1.79 | 1.76 | 1.74 | 1.76 | 1861 |
| 23BT1128 | 15W/27N | 20-30 cm | 3.11 | 3.1 | 2.86 | 3.02 | 1967 |
| 23BT1128 | 15W/27N | 20-30 cm | 1.81 | 1.85 | 1.88 | 1.85 | 1868 |
| 23BT1128 | 15W/27N | 20-30 cm | 1.79 | 1.79 | 1.78 | 1.79 | 1863 |
| 23BT1128 | 15W/27N | 20-30 cm | 2.23 | 2.2 | 2.15 | 2.19 | 1897 |
| 23BT1128 | 15W/27N | 20-30 cm | 2.12 | 2.11 | 2.13 | 2.12 | 1891 |
| 23BT1128 | 15W/27N | 20-30 cm | 2.36 | 2.4 | 2.44 | 2.40 | 1915 |
| 23BT1128 | 15W/27N | 20-30 cm | 1.96 | 1.98 | 2.02 | 1.99 | 1880 |
| 23BT1128 | 15W/27N | 20-30 cm | 1.79 | 1.85 | 1.9 | 1.85 | 1868 |
| 23BT1128 | 15W/27N | 20-30 cm | 2.06 | 2.06 | 2.06 | 2.06 | 1886 |
| 23BT1128 | 15W/27N | 20-30 cm | 2.38 | 2.68 | 2.79 | 2.62 | 1933 |
| 23BT1128 | 15W/27N | 20-30 cm | 2.25 | 2.23 | 2.23 | 2.24 | 1901 |
| 23BT1128 | 15W/27N | 20-30 cm | 2.22 | 2.22 | 2.22 | 2.22 | 1900 |
| 23BT1128 | 15W/27N | 20-30 cm | 2.29 | 2.25 | 2.2 | 2.25 | 1902 |
| 23BT1128 | 15W/27N | 20-30 cm | 2.22 | 2.23 | 2.23 | 2.23 | 1900 |
| 23BT1128 | 15W/27N | 20-30 cm | 2.11 | 2.13 | 2.16 | 2.13 | 1892 |
| 23BT1128 | 15W/27N | 20-30 cm | 2.1 | 2.12 | 2.17 | 2.13 | 1892 |
| 23BT1128 | 15W/27N | 20-30 cm | 2.51 | 2.5 | 2.44 | 2.48 | 1922 |
| 23BT1128 | 15W/27N | 20-30 cm | 3.27 | 3.26 | 3.22 | 3.25 | 1986 |
| 23BT1128 | 15W/27N | 20-30 cm | 1.97 | 1.96 | 1.95 | 1.96 | 1878 |
| 23BT1128 | 15W/27N | 20-30 cm | 2.35 | 2.34 | 2.32 | 2.34 | 1909 |
| 23BT1128 | 15W/27N | 20-30 cm | 2.16 | 2.17 | 2.15 | 2.16 | 1895 |
| 23BT1128 | 15W/27N | 20-30 cm | 1.88 | 1.82 | 1.75 | 1.82 | 1866 |
| 23BT1128 | 15W/27N | 20-30 cm | 2.08 | 2.12 | 2.14 | 2.11 | 1891 |
| 23BT1128 | 15W/27N | 20-30 cm | 1.99 | 1.97 | 1.96 | 1.97 | 1879 |
| 23BT1128 | 15W/27N | 20-30 cm | 1.99 | 2 | 1.97 | 1.99 | 1880 |
| 23BT1128 | 15W/27N | 20-30 cm | 2.4 | 2.42 | 2.42 | 2.41 | 1916 |
| 23BT1128 | 15W/27N | 20-30 cm | 2 | 2.03 | 2.05 | 2.03 | 1883 |
| 23BT1128 | 15W/27N | 20-30 cm | 2.33 | 2.3 | 2.25 | 2.33 | 1909 |
| 23BT1128 | 15W/27N | 20-30 cm | 2.11 | 2.13 | 2.13 | 2.12 | 1892 |
| 23BT1128 | 15W/27N | 20-30 cm | 1.98 | 2.01 | 1.92 | 1.97 | 1879 |
| 23BT1128 | 15W/27N | 20-30 cm | 1.84 | 1.84 | 1.85 | 1.84 | 1868 |
| 23BT1128 | 15W/27N | 20-30 cm | 2.1 | 2.08 | 2.1 | 2.09 | 1889 |
| 23BT1128 | 15W/27N | 20-30 cm | 2.09 | 2.12 | 2.22 | 2.14 | 1893 |
| 23BT1128 | 15W/27N | 20-30 cm | 1.99 | 2 | 2.01 | 2.00 | 1881 |
| 23BT1128 | 15W/27N | 20-30 cm | 3.16 | 3.21 | 3.2 | 3.19 | 1981 |
| 23BT1128 | 15W/27N | 20-30 cm | 2.23 | 2.26 | 2.27 | 2.25 | 1902 |
| 23BT1128 | 15W/27N | 20-30 cm | 2.56 | 2.49 | 2.45 | 2.50 | 1923 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 23BT1128 | 15W/27N | 20-30 cm | 2.35 | 2.35 | 2.35 | 2.35 | 1911 |
| 23BT1128 | 15W/27N | 20-30 cm | 2.1 | 2.1 | 2.07 | 2.09 | 1889 |
| 23BT1128 | 15W/27N | 20-30 cm | 2.25 | 2.25 | 2.23 | 2.24 | 1902 |
| 23BT1128 | 15W/27N | 20-30 cm | 2.36 | 2.33 | 2.32 | 2.34 | 1909 |
| 23BT1128 | 15W/27N | 20-30 cm | 2.02 | 2.55 | 2.73 | 2.43 | 1918 |
| 23BT1128 | 15W/27N | 20-30 cm | 2.81 | 2.8 | 2.75 | 2.79 | 1947 |
| 23BT1128 | 15W/27N | 20-30 cm | 2.65 | 2.66 | 2.68 | 2.66 | 1937 |
| 23BT1128 | 15W/27N | 20-30 cm | 2.13 | 2.12 | 2.09 | 2.11 | 1891 |
| 23BT1128 | 15W/27N | 20-30 cm | 3.12 | 3.11 | 2.85 | 3.03 | 1968 |
| 23BT1128 | 15W/27N | 20-30 cm | 2.33 | 2.32 | 2.31 | 2.32 | 1908 |
| 23BT1128 | 15W/27N | 20-30 cm | 2.44 | 2.42 | 2.37 | 2.41 | 1916 |
| 23BT1128 | 15W/27N | 20-30 cm | 3.13 | 3.17 | 3.16 | 3.15 | 1978 |
| 23BT1128 | 15W/27N | 20-30 cm | 2.32 | 2.3 | 2.32 | 2.31 | 1908 |
| 23BT1128 | 15W/27N | 20-30 cm | 2.59 | 2.6 | 2.58 | 2.59 | 1931 |
| 23BT1128 | 15W/27N | 20-30 cm | 2.1 | 2.18 | 2.09 | 2.12 | 1892 |
| 23BT1128 | 15W/27N | 20-30 cm | 2.4 | 2.35 | 2.3 | 2.35 | 1911 |
| 23BT1128 | 15W/27N | 20-30 cm | 2.98 | 3.12 | 3.06 | 3.05 | 1970 |
| 23BT1128 | 15W/27N | 20-30 cm | 3.1 | 3.14 | 3.13 | 3.12 | 1976 |
| 23BT1128 | 15W/27N | 20-30 cm | 2.32 | 2.31 | 2.33 | 2.32 | 1908 |
| 23BT1128 | 15W/27N | 20-30 cm | 3.16 | 3.07 | 3.16 | 3.13 | 1976 |

23BT1129 Window Glass Data:

| Site | Unit/Auger | Depth | #1 | #2 | #3 | Mean | Age of Manufacture |
|---|---|---|---|---|---|---|---|
| 23BT1129-A | 1.5W/2.5N | 10-20 cm | 1.88 | 1.84 | 1.82 | 1.85 | 1868 |
| 23BT1129-A | 2E/2.5N | 20-30 cm | 1.91 | 1.92 | 1.94 | 1.92 | 1875 |
| 23BT1129-A | 13E/14S | 0-10 cm | 2.69 | 2.7 | 2.7 | 2.70 | 1940 |
| 23BT1129-A | 13E/15S | 20-30 cm | 2.36 | 2.36 | 2.37 | 2.36 | 1912 |
| 23BT1129-A | 13E/15S | 20-30 cm | 2.82 | 2.82 | 2.8 | 2.81 | 1950 |
| 23BT1129-A | 6.5E/5S | 0-10 cm | 1.77 | 1.79 | 1.86 | 1.81 | 1865 |
| 23BT1129-A | 2E/4S | 10-20 cm | 2.01 | 2.01 | 2.01 | 2.01 | 1882 |
| 23BT1129-A | 2E/4S | 10-20 cm | 2.74 | 2.76 | 2.77 | 2.76 | 1945 |
| 23BT1129-A | 2E/4S | 20-30 cm | 2.59 | 2.6 | 2.6 | 2.60 | 1931 |
| 23BT1129-A | 11E/15S | 0-10 cm | 2.74 | 2.75 | 2.74 | 2.74 | 1944 |
| 23BT1129-A | 13E/15S | 0-10 cm | 2.1 | 2.1 | 2.07 | 2.09 | 1889 |
| 23BT1129-A | 13E/15S | 0-10 cm | 2.67 | 2.68 | 2.69 | 2.68 | 1938 |
| 23BT1129-A | 12E/14S | 10-20 cm | 2.17 | 2.18 | 2.19 | 2.18 | 1896 |
| 23BT1129-A | 12E/14S | 10-20 cm | 2.12 | 2.11 | 2.1 | 2.11 | 1890 |
| 23BT1129-A | 13E/14S | 10-20 cm | 2.36 | 2.34 | 2.3 | 2.33 | 1909 |
| 23BT1129-A | 12E/15S | 10-20 cm | 2.79 | 2.8 | 2.81 | 2.80 | 1949 |
| 23BT1129-A | 12E/15S | 10-20 cm | 2.66 | 2.69 | 2.73 | 2.69 | 1940 |
| 23BT1129-A | 11E/13S | 0-10 cm | 2.68 | 2.85 | 3.03 | 2.85 | 1953 |
| 23BT1129-A | 11E/13S | 0-10 cm | 2.81 | 2.92 | 2.99 | 2.91 | 1957 |
| 23BT1129-A | 11E/13S | 10-20 cm | 2.94 | 3.17 | 3.17 | 3.09 | 1973 |
| 23BT1129-A | 11E/13S | 10-20 cm | 2.86 | 3.11 | 3.23 | 3.07 | 1971 |
| 23BT1129-A | 11E/13S | 10-20 cm | 2.42 | 2.41 | 2.42 | 2.42 | 1916 |
| 23BT1129-A | 11E/13S | 10-20 cm | 2.49 | 2.55 | 2.59 | 2.54 | 1927 |
| 23BT1129-A | 11E/13S | 10-20 cm | 2.79 | 2.9 | 3.1 | 2.93 | 1959 |
| 23BT1129-A | 11E/13S | 10-20 cm | 2.98 | 2.91 | 2.78 | 2.89 | 1956 |
| 23BT1129-A | 11E/13S | 10-20 cm | 2.15 | 2.14 | 2.13 | 2.14 | 1893 |
| 23BT1129-A | 11E/13S | 10-20 cm | 2.58 | 2.58 | 2.59 | 2.58 | 1930 |
| 23BT1129-A | 11E/15S | 10-20 cm | 2.11 | 2.11 | 2.08 | 2.10 | 1890 |
| 23BT1129-A | 11E/15S | 10-20 cm | 2.06 | 2.07 | 2.09 | 2.07 | 1887 |
| 23BT1129-A | 11E/15S | 10-20 cm | 2.17 | 2.2 | 2.2 | 2.19 | 1897 |
| 23BT1129-A | 11E/15S | 10-20 cm | 2.34 | 2.36 | 2.36 | 2.35 | 1911 |
| 23BT1129-A | 11E/15S | 10-20 cm | 1.8 | 1.8 | 1.78 | 1.79 | 1864 |
| 23BT1129-A | 11E/15S | 10-20 cm | 2.16 | 2.17 | 2.14 | 2.16 | 1894 |
| 23BT1129-A | 11E/15S | 10-20 cm | 2.04 | 2.06 | 2.09 | 2.06 | 1886 |
| 23BT1129-A | 11E/15S | 10-20 cm | 2.33 | 2.33 | 2.29 | 2.32 | 1908 |
| 23BT1129-A | 11E/15S | 10-20 cm | 2.48 | 2.45 | 2.41 | 2.45 | 1919 |
| 23BT1129-A | 11E/15S | 10-20 cm | 2.9 | 2.89 | 2.87 | 2.89 | 1956 |
| 23BT1129-A | 11E/15S | 10-20 cm | 2.31 | 2.31 | 2.28 | 2.30 | 1906 |
| 23BT1129-A | 11E/15S | 10-20 cm | 1.78 | 1.93 | 2.05 | 1.92 | 1874 |
| 23BT1129-A | 11E/15S | 20-30 cm | 2.83 | 2.83 | 2.83 | 2.83 | 1951 |
| 23BT1129-A | 11E/15S | 20-30 cm | 2.65 | 2.64 | 2.61 | 2.63 | 1934 |
| 23BT1129-A | 11E/15S | 20-30 cm | 2.18 | 2.18 | 2.17 | 2.18 | 1896 |
| 23BT1129-A | 11E/15S | 20-30 cm | 1.73 | 1.74 | 1.76 | 1.74 | 1860 |
| 23BT1129-A | 11E/15S | 20-30 cm | 2.86 | 2.86 | 2.85 | 2.86 | 1953 |
| 23BT1129-A | 11E/15S | 20-30 cm | 2.14 | 2.15 | 2.14 | 2.14 | 1893 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 23BT1129-A | 11E/15S | 20-30 cm | 2.34 | 2.35 | 2.31 | 2.33 | 1909 |
| 23BT1129-A | 11E/15S | 20-30 cm | 2.65 | 2.62 | 2.56 | 2.61 | 1933 |
| 23BT1129-A | 11E/15S | 20-30 cm | 2.81 | 2.81 | 2.79 | 2.80 | 1949 |
| 23BT1129-A | 11E/15S | 20-30 cm | 3.29 | 3.06 | 2.75 | 3.03 | 1968 |
| 23BT1129-A | 11E/15S | 20-30 cm | 2.03 | 2.05 | 2.05 | 2.04 | 1885 |
| 23BT1129-A | 11E/15S | 20-30 cm | 2.73 | 2.75 | 2.71 | 2.73 | 1943 |
| 23BT1129-A | 11E/15S | 20-30 cm | 2.4 | 2.26 | 2.01 | 2.22 | 1900 |
| 23BT1129-A | 11E/15S | 20-30 cm | 1.83 | 1.79 | 1.75 | 1.79 | 1863 |
| 23BT1129-A | 11E/15S | 20-30 cm | 2.39 | 2.38 | 2.37 | 2.38 | 1913 |
| 23BT1129-A | 11E/15S | 20-30 cm | 2.39 | 2.44 | 2.51 | 2.45 | 1919 |
| 23BT1129-A | 10E/14S | 10-20 cm | 2.36 | 2.37 | 2.38 | 2.37 | 1912 |
| 23BT1129-A | 10E/14S | 10-20 cm | 2.14 | 2.15 | 2.15 | 2.15 | 1893 |
| 23BT1129-A | 10E/14S | 10-20 cm | 2.1 | 2.08 | 2.05 | 2.08 | 1888 |
| 23BT1129-A | 10E/14S | 10-20 cm | 2.46 | 2.45 | 2.41 | 2.44 | 1918 |
| 23BT1129-A | 10E/14S | 10-20 cm | 2.44 | 2.43 | 2.43 | 2.43 | 1918 |
| 23BT1129-A | 10E/14S | 10-20 cm | 2.23 | 2.24 | 2.22 | 2.23 | 1901 |
| 23BT1129-A | 10E/14S | 10-20 cm | 2.37 | 2.31 | 2.24 | 2.31 | 1907 |
| 23BT1129-A | 10E/14S | 10-20 cm | 2.18 | 2.22 | 2.38 | 2.26 | 1903 |
| 23BT1129-A | 10E/14S | 10-20 cm | 1.75 | 1.78 | 1.79 | 1.77 | 1862 |
| 23BT1129-A | 10E/14S | 10-20 cm | 3.33 | 3.32 | 3.37 | 3.34 | 1994 |
| 23BT1129-A | 10E/14S | 10-20 cm | 2.72 | 2.71 | 2.73 | 2.72 | 1942 |
| 23BT1129-A | 10E/14S | 10-20 cm | 2.69 | 2.68 | 2.66 | 2.68 | 1938 |
| 23BT1129-A | 10E/14S | 10-20 cm | 3.23 | 3.16 | 2.99 | 3.13 | 1976 |
| 23BT1129-A | 10E/14S | 10-20 cm | 2.13 | 2.16 | 2.1 | 2.13 | 1892 |
| 23BT1129-A | 10E/14S | 10-20 cm | 2.19 | 2.3 | 2.16 | 2.22 | 1899 |
| 23BT1129-A | 10E/14S | 10-20 cm | 2.67 | 2.68 | 2.69 | 2.68 | 1938 |
| 23BT1129-A | 12E/15S | 20-30 cm | 2.59 | 2.59 | 2.59 | 2.59 | 1931 |
| 23BT1129-A | 12E/15S | 20-30 cm | 2.56 | 2.62 | 2.64 | 2.61 | 1932 |
| 23BT1129-A | 12E/15S | 20-30 cm | 2.82 | 2.85 | 2.87 | 2.85 | 1952 |
| 23BT1129-A | 12E/15S | 20-30 cm | 2.5 | 2.54 | 2.59 | 2.54 | 1927 |
| 23BT1129-A | 12E/15S | 20-30 cm | 2.59 | 2.62 | 2.69 | 2.63 | 1934 |
| 23BT1129-A | 12E/15S | 20-30 cm | 2.24 | 2.26 | 2.27 | 2.26 | 1903 |
| 23BT1129-A | 12E/15S | 20-30 cm | 2.52 | 2.5 | 2.47 | 2.50 | 1923 |
| 23BT1129-A | 12E/15S | 20-30 cm | 1.8 | 1.8 | 1.82 | 1.81 | 1865 |
| 23BT1129-A | 12E/15S | 20-30 cm | 2.56 | 2.55 | 2.52 | 2.54 | 1927 |
| 23BT1129-A | 12E/15S | 20-30 cm | 2.57 | 2.56 | 2.56 | 2.56 | 1929 |
| 23BT1129-A | 12E/15S | 20-30 cm | 2.6 | 2.61 | 2.54 | 2.58 | 1930 |
| 23BT1129-A | 12E/15S | 20-30 cm | 2.57 | 2.59 | 2.64 | 2.60 | 1932 |
| 23BT1129-A | 12E/15S | 20-30 cm | 2.39 | 2.39 | 2.33 | 2.37 | 1912 |
| 23BT1129-A | 12E/15S | 20-30 cm | 2.42 | 2.44 | 2.42 | 2.43 | 1917 |
| 23BT1129-A | 12E/15S | 20-30 cm | 2.74 | 2.74 | 2.73 | 2.74 | 1943 |
| 23BT1129-A | 12E/15S | 20-30 cm | 1.97 | 1.96 | 1.9 | 1.94 | 1876 |
| 23BT1129-A | 12E/15S | 20-30 cm | 2.52 | 2.57 | 2.67 | 2.59 | 1931 |
| 23BT1129-A | 12E/15S | 20-30 cm | 2.66 | 2.66 | 2.71 | 2.68 | 1938 |
| 23BT1129-A | 11E/14S | 10-20 cm | 2.97 | 2.87 | 2.58 | 2.81 | 1949 |
| 23BT1129-A | 11E/14S | 10-20 cm | 2.78 | 2.78 | 2.78 | 2.78 | 1947 |
| 23BT1129-A | 11E/14S | 10-20 cm | 3.06 | 3.03 | 2.97 | 3.02 | 1967 |
| 23BT1129-A | 11E/14S | 10-20 cm | 1.92 | 2 | 2.06 | 1.99 | 1881 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 23BT1129-A | 11E/14S | 10-20 cm | 2.11 | 2.11 | 2.14 | 2.12 | 1891 |
| 23BT1129-A | 11E/14S | 10-20 cm | 2.75 | 2.75 | 2.75 | 2.75 | 1944 |
| 23BT1129-A | 11E/14S | 10-20 cm | 2.83 | 2.82 | 2.8 | 2.82 | 1950 |
| 23BT1129-A | 11E/14S | 10-20 cm | 2.42 | 2.42 | 2.44 | 2.43 | 1917 |
| 23BT1129-A | 11E/14S | 10-20 cm | 2.49 | 2.5 | 2.49 | 2.49 | 1923 |
| 23BT1129-A | 11E/14S | 10-20 cm | 2.2 | 2.2 | 2.21 | 2.20 | 1898 |
| 23BT1129-A | 11E/14S | 10-20 cm | 2.13 | 2.14 | 2.15 | 2.14 | 1893 |
| 23BT1129-A | 13E/15S | 10-20 cm | 2.94 | 2.94 | 2.93 | 2.94 | 1960 |
| 23BT1129-A | 13E/15S | 10-20 cm | 2.6 | 2.61 | 2.61 | 2.61 | 1932 |
| 23BT1129-A | 13E/15S | 10-20 cm | 2.81 | 2.81 | 2.8 | 2.81 | 1949 |
| 23BT1129-A | 13E/15S | 10-20 cm | 2.57 | 2.6 | 2.61 | 2.59 | 1931 |
| 23BT1129-A | 13E/15S | 10-20 cm | 1.67 | 1.66 | 1.65 | 1.66 | 1853 |
| 23BT1129-A | 13E/15S | 10-20 cm | 2.55 | 2.57 | 2.55 | 2.56 | 1928 |
| 23BT1129-A | 13E/15S | 10-20 cm | 2.41 | 2.21 | 1.98 | 2.20 | 1898 |
| 23BT1129-A | 13E/15S | 10-20 cm | 2.62 | 2.6 | 2.6 | 2.61 | 1932 |
| 23BT1129-A | 13E/15S | 10-20 cm | 2.86 | 2.79 | 2.8 | 2.82 | 1950 |
| 23BT1129-A | 13E/15S | 10-20 cm | 2.59 | 2.62 | 2.64 | 2.62 | 1933 |
| 23BT1129-A | 15W/29N | 0-10 cm | 2.69 | 2.66 | 2.64 | 2.66 | 1937 |

## Appendix D

**In Search of Fort Africa**
Archaeological Testing and Re-Evaluation of Sites 23BT1130 and 23BT1131
Battle of Island Mound State Historic Site

by

Ann M. Raab and L. Mark Raab
Draft of 11-19-11

***Executive Summary***

**Previous Research Findings**

The Battle of Island Mound, Bates County, Missouri was the first engagement of African American troops against Confederate forces of the American Civil War. During this engagement, the 1st Kansas Colored Volunteer Infantry occupied the farm house of Enoch and Christiana Toothman, renaming it Fort Africa. In 2008, the State of Missouri acquired 40 acres for the Battle of Island Mound State Historic Site (Site), including the location of the no-longer-extant Toothman house/Fort Africa. Three previous studies were conducted to determine the location of the Toothman house/Fort Africa. Historical research and a brief field inspection by Tabor (2001) found two archaeological sites; one identified by Tabor as the location of the Toothman house/Fort Africa, the other a late 19th century church. Two subsequent field investigations were made of the two sites found by Tabor. Accepting Tabor's conjecture about the locations of the house and church, a geophysical survey (De Vore 2009) and related metal detector survey (Thiessen 2009) were conducted, designating the house as archaeological site 23BT21130 and the church as 23BT1131. Critical to the results of these studies was the assumption that Tabor had correctly identified the locations of the Toothman house/Fort Africa and the church.

## Research Findings of the Present Study

The present study represents the first systematic archaeological "ground truthing" of sites 23BT1130 and 23BT1131. Results of the present study cast considerable doubt on the accuracy of Tabor's characterization of site 23BT1130 as the Toothman house/Fort Africa and of site 23BT1131 as an unrelated, late 19th century church. The historical role of these two sites should be re-evaluated. Based on the results of archaeological testing, as well as comparison with data from the metal detector survey (Thiessen 2009), 23BT1130 appears to represent late 19th century and 20th century farming activities. The absence of Civil War-era construction or artifacts at 23BT1130 makes this site an unpromising candidate for the Toothman house/Fort Africa. While Tabor assumed that a late 19th century church was unlikely to be constructed on a Civil War-era house location, the present study points to just such a possibility. The present study found archaeological evidence indicating the existence of a probable Civil War-era structure at 23BT1131, followed by re-use of the site for a post-war church. Currently available evidence does not conclusively establish that such a Civil War-era occupation of 23BT1131 was the Toothman house/Fort Africa. However, in light of the findings in this report, site 23BT1131 cannot currently be excluded as a possible location of the Toothman house/Fort Africa.

## Recommendations

Additional archaeological research should be conducted on site 23BT1131 to better understand the site's history. The scope of this research should be sufficient to clarify the site's possible Civil War-era occupational component and possible links to the Toothman house/Fort Africa.

With additional notoriety and Site development, archaeological sites such as 23BT1131 face increasing risk of damage from unauthorized digging and artifact collecting (e.g., metal detecting). The Site should be monitored to prevent this kind of damage.

## Table of Contents

***Introduction***

In 2008**,** the State of Missouri acquired 40 acres in Bates County, creating the state's newest historic site. The Battle of Island Mound State Historic Site (Site) commemorates events of regional and national importance, reflecting the tumultuous decades of the Missouri-Kansas Border War (1854-1861) and the escalation of this conflict into the American Civil War (1861-1865). In the fall of 1862, troops of the 1st Kansas Colored Volunteer Infantry, including many ex-slaves, were the first African Americans of the Civil War to enter into combat against pro-Confederate forces, using land now encompassed by the Site. The Battle of Island Mound, 27-29 October, 1862, was the unit's baptism by fire, defeating pro-Confederate forces in a brief but ferocious fight that garnered attention across the country (Thiessen et al. 2009). The staging area for this fight was the farm of a Confederate sympathizer, Enoch Toothman, including a farm house commandeered by African American soldiers and re-named Fort Africa (Tabor 2001; Thiessen).

But where was Fort Africa? The Toothman house is no longer extant or included in any known historic map. Moreover, historic descriptions of the house and its environs are slight and ambiguous. Archaeological investigation, in conjunction with historical research, affords perhaps the best means of identifying the location of the Toothman house/Fort Africa. Archaeological signatures likely to be associated with the Toothman place, including Civil-War-era structural remains and artifacts, are potentially discernable. The benefits of resolving the location of the Toothman farm and Fort Africa are clear. This information will be useful in protecting the Site's valuable archaeological

heritage from unwarranted disturbance, and in the interpretation of the Site's historical significance to wide audiences.

Three previous studies have been made of the study area in efforts to identify the location of the Toothman house/Fort Africa. The first of these was by Tabor (2001), based primarily on historical documents research, but also including "folk histories" derived from contemporary county residents, and a brief field inspection of the study area. Tabor, as we discuss in the report Section on Assessment and Recommendations, identified two archaeological sites during a field reconnaissance of the study area. The two archaeological sites identified by Tabor were subsequently recorded as 23BT1130 and 23BT1131, and targeted for a geophysical survey (De Vore 2009), the results of which are summarized below. In a study designed to complement the geophysical investigation, a metal detector survey was conducted by Thiessen et al. (2009), aiming to characterize the distribution and age of metal artifacts located in and around sites 23BT1130 and 23BT1131. Findings of the metal detector survey are addressed in the report section on Assessment and Recommendations. While these earlier investigations each make distinctive and valuable contributions to the search for Fort Africa, the present study represents the first systematic archaeological "ground truthing" of sites 23BT1130 and 23BT1131 and of the interpretations of these sites offered by the previous investigations.

Results of the present study underscore the many difficulties involved in linking historical events to archaeological signatures of unknown location. It is important to understand the nature of the evidence which typically informs this process. Archaeological data from 19$^{th}$ century farmsteads frequently includes artifacts indicative

of time (often measured in decades), structural remains associated with dwellings and other buildings, and artifacts characteristic of domestic and agrarian activities. Artifacts such as nails, ceramic and glass fragments, food bones, metal implements and others are commonly encountered. These data rarely point to specific individuals or events. Military actions are subject to similar constraints. Events of short duration, such as the brief occupation of the Toothman farmstead by Union forces, are unlikely to deposit large numbers of artifacts, making archaeological detection difficult on the basis of small samples of excavated material.

In addition, conditions of post-deposition preservation play an important role in determining the character of archaeological deposits. Modern, ground-disturbing activities frequently have degraded the integrity of historic archaeological sites. Another difficulty is interpreting the reliability of mixed evidence. By mixed evidence we mean that historical archaeological investigations often must rely on sources of information as diverse as historical documents, folk histories and material archaeological data. Each of these can make significant contributions to accurate reconstruction of historical events, but each must be critically evaluated in terms of empirical support and cross-validation by differing lines of evidence. Sequential stages of investigation, collecting larger and more diverse types of data for critical analysis is also helpful in the search for Fort Africa. Based on this kind of investigative process, the present study suggests that previous understandings of the location of Fort Africa should be significantly revised.

Two other goals of the present investigation deserve comment. The geophysical survey report noted above, in identifying site 23BT1131 as a church, suggested that a

cemetery might be located in proximity to the church. One of the goals of the presented investigation was to determine if graves are located in the area of 23BT1131. As described in the section on Test Excavation Results, the present study found no evidence of burials or a cemetery. Additionally, our efforts were aimed at determining the degree of archaeological integrity of the study sites (see Test Excavation Results).

### *Historic Overview*

Several insightful accounts of the events surrounding the Battle of Island Mound are available, including Chris Tabor's (2001) volume, *Skirmish at Island Mound*, and reports by Thiessen et al. (2009) and De Vore (2009). De Vore (2009:2-3) offers a concise and informative description of the historical events leading up to the Battle of Island Mound and the role of the Toothman farmstead in the fighting:

> During the early days of the Civil War, the fighting along the Missouri-Kansas border had developed into guerilla warfare with Southern and Northern supporters attacking the opposition. Confederate Bushwhackers from Bates County, Missouri, conducted numerous raids on pro-Union farmers and Federal patrols in the region that the local pro-Union inhabitants asked for protection from Federal troops (Tabor 2001:2-4). By the summer of 1862, the Civil War was not going well for the Federal cause. In order to replace the staggering Federal casualties, President Lincoln called for additional troops. Kansas answered the call by recruiting men including those of African-American descent (Tabor 2001:5-8). On October 26th, 1862, the 1st Kansas Colored Infantry and the 5th Kansas Cavalry were ordered to deal with the Bates County Bushwhackers (Tabor 2001:9-12). The Kansas force arrived at the Enoch Toothman farm on the afternoon of October 27nd, 1862. The troops used the Toothman farm as their headquarters and erected barricades around the house from the farm's rail fences. The skirmish between the Kansas troops and the Missouri guerillas occurred over the next few days (Tabor 2001:13-16). During the fight, the Toothman farmstead served as Kansas troops' headquarters and hospital. After the skirmish, the Bushwhackers withdrew and the Kansas troops gathered their dead. The Kansas troop loses included eight men killed and eleven men wounded by hostile fire and hand-to-

> hand combat. The dead enlisted men were buried to the north of the Toothman farm house (Tabor 2001:16). On November 1st, 1862, the Kansas troops returned to Kansas and Fort Lincoln (Tabor 2001:16). An 1875 plat of Bates County indicated that the house on the property was located in the southeast corner of the 80-acre farm. There was no indication of the Toothman farm house on the plat and it was assumed that the house and other farm buildings belonging to the Toothman family were abandoned or destroyed by the date of the county plat (Douglas Scott, personal communications 2009). The Methodist Episcopal Church was also identified on the 1875 plat in the northwest corner of the northwest corner of the property (Douglas Scott, personal communication 2009). It was apparently built around 1871 (Brant Vollman, personal communications 2009) and removed sometime in the 1930s (Douglas Scott, personal communications 2009).

***Geophysical Survey Results***

Archaeological testing of the study area focused on the two archaeological sites targeted for geophysical survey. De Vore (2009:13) summarizes the results of this investigation:

> Between March 4th and 7th, 2009, the Midwest Archeological Center provided technical support to the Missouri Department of Natural Resources, Division of State Parks for the evaluation archeological resources of the Battle of Island Mound State Historic Site. The archeological prospection inventory of the Toothman farmstead (Site 23BT1130) and the Methodist Episcopal Church (Site 23BT 1131) sites located in the two tree groves in the northwest corner of the state park property consisted of a magnetic and a resistance survey of two geophysical project areas. In addition to the magnetic and resistance surveys of the two sites, a metal detector survey was conducted across the 40-acre state park property. The total area of the two geophysical project areas consisted of 6,400 $m^2$ or 1.58 acres. The geophysical survey resulted in the identification of numerous subsurface anomalies associated with the Toothman farmstead (Site 23BT1130) and the Method Episcopal Church (Site 23BT1131) in Bates County, Missouri. Based on the geophysical survey of the project area, Site 23BT1130 hosts a complex series of intact historic archeological resources related to the Toothman farmstead. Site 23BT1131 contains the church foundation, paths leading to the church, and a stone alignment that apparently represented the eastern edge of the church yard. There may be a small cemetery north of the church foundation.

Figure 1 is an interpretation of the results of the geophysical survey of site 23BT1130. Devore (2009:31) describes 23BT1130 as a "complex series of intact historic archaeological resources related to the Toothman farmstead." Figure 2 shows site 23BT1131, interpreting the rectilinear stone foundations near the center of the figure as the Methodist Episcopal Church recorded in the 1875 plat map (De Vore 2009:33).

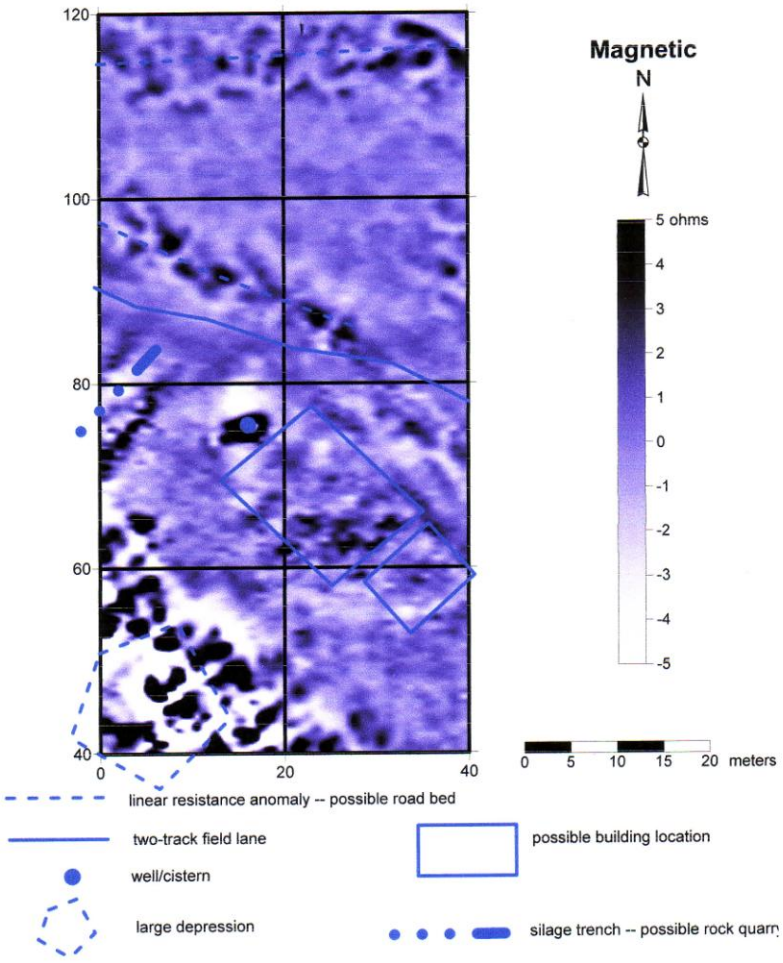


*Figure 1: Geophysical interpretive map, site 23BT1130 from DeVore 2009:31*

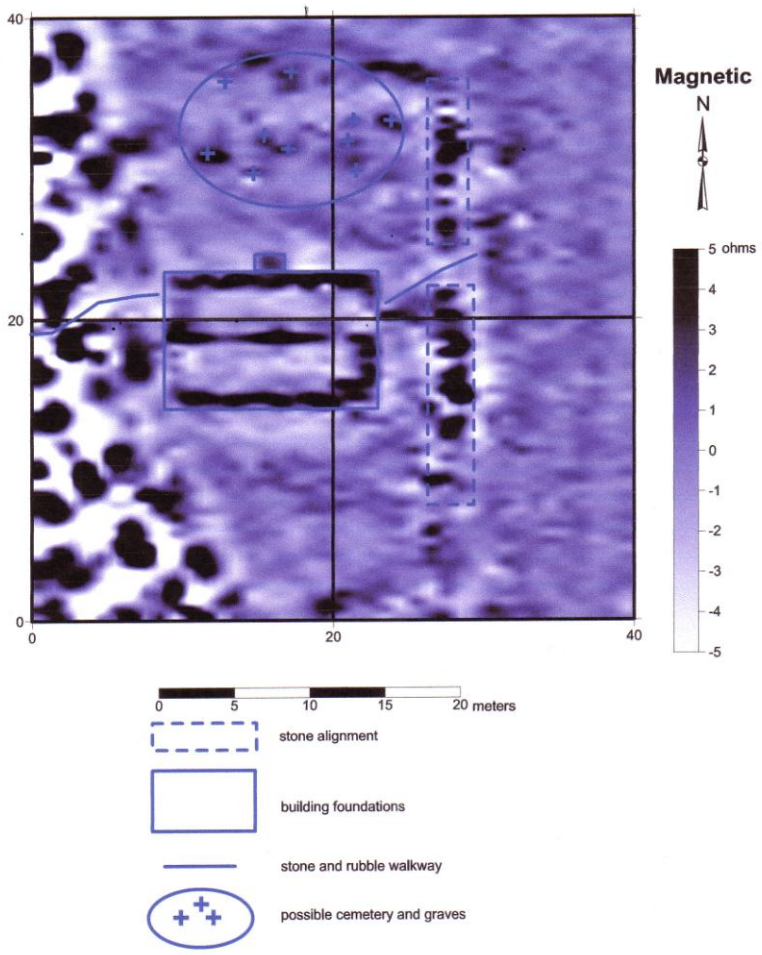


*Figure 2: Geophysical interpretive map, site 23BT1131, from De Vore 2009:33*

Interpretations of the geophysical survey, while a valuable starting point for archaeological investigations, should be viewed as a provisional model, rather than final conclusions about the nature of sites 23BT1130 and 23BT1131. It is important to remember that scientific models of this type frequently are revised on the basis of new archaeological data. This point is recognized by De Vore (2009:13), who notes:

> While the magnetic and resistance survey result provided data on the nature of the buried archeological resources, it is important to conduct additional archeological investigations to verify the interpretations

> (ground truthing) of the geophysical anomalies and to determine their true nature.

As De Vore emphasizes, archaeological "ground truthing" is critical to understanding the true nature of sub-surface cultural deposits. Only archaeological excavation and analysis of the results offers direct observation of the archaeological deposits and their depositional and cultural context. The present investigation underlines the importance of this point. Archaeological testing produced a more complex picture of sites 23BT1130 and 23BT1131 than the geophysical survey, as discussed below in the report sections on Testing Results and Assessment and Recommendations.

***Test Excavation Methods***

A sequence of testing techniques was used to sample sites 23BT1130 and 23BT1131 between 10 and 19 May, 2001. In keeping with standard archaeological practice, a grid system was created for designating the provenience (grid location) of all activities. Ideally, sequential archaeological investigations of a particular locality should avail themselves of the same geophysical reference points (site datums). In this instance, comparing the results of archaeological testing with the results of the geophysical survey required bringing the two study phases reasonably into "sync" with regard to spatial coordinates. Lacking a permanent site datum from the geophysical survey, we used the well noted in the map of site 23BT1130 (De Vore 2009:23) as a reference point for establishing concrete-and-nail datum points at site 23BT1130 (all such datum points were left in the field for reference by possible future excavations). Two such points, a primary

datum and back-sight, were set at grid coordinates 20 meters east/80 meters north (20E/80N- primary datum) to 20E/60N (back-sight). The line between these points, aligned on magnetic north, served as the principal sampling transect for site 23BT1130. This line, and all subsequent measured points, was created with a Berger Model 2T, 24X optical surveyor's transit (Figure 3).

*Figure 3: Transit and north-south soil auger testing line, site 23BT1131*

Soil auger samples were taken at 2-meter intervals along this transect, using a 10-centimeter diameter bucket auger. Auger samples were extracted in ten-centimeter increments until encountering bedrock, approximately 50 centimeters below the surface. This method was used to obtain information about the density of artifacts and cultural features in the site's soil/sediment matrix. All excavated matrix samples were processed

using ¼-inch (.635 cm) mesh screens. All artifacts were recorded by provenience, collected, and cataloged. Observation was made of the site's soil/sediment characteristics.

Auger sampling was followed by excavation of test pits (Figure 4, for example). The latter were located to characterize areas of the site with both relatively high and low densities of artifacts and/or structural remains or soil/sediment disturbance of a cultural nature. Excavation units of .5 $m^2$ and 1 $m^2$ were utilized, pending upon the desired sample size to be obtained from a given location. Each unit was excavated in 10 cm levels. After reaching culturally sterile strata in each unit, a profile map was produced reflecting stratigraphic interpretations. The sidewalls were recorded photographically. Every excavation level of each unit was described in unit-level forms, with observations as to context, disturbance levels and sediment characteristics recorded. In all cases, the objective of subsurface sampling was to determine cultural components, the horizontal and vertical distribution of artifacts and, where encountered, cultural features, and the degree of site preservation. All artifacts recovered by auger testing and excavation were sent to the lab for cataloging (Appendix 1 – on file with Missouri State Parks).

*Figure 4. Archaeological test pit, site 23BT1131*

The principal datum at site 23BT1130 (80N/60E) was used as the zero point for extending the provenience grid to site 23BT1131, using the surveyor's transit for this purpose. Primary and back-sight datums (concrete-and-nail) were created at 23BT1131 (53N/37W to 113N/37W). The line between these datums formed a sampling transect for auger testing and test excavations in the manner used at 23BT1130. Geophysical survey and surface inspection of 23BT1131 revealed distinct structural remains in the form of a rectilinear stone foundations and a stone wall (Figure 2). Additionally, geophysical survey posed the possibility that anomalies north of the foundations might be burials related to a church cemetery. For this reason, auger tests and excavation pits targeted these areas to better understand their archaeological character. The provenience designations of all auger tests and test pits can be found in Appendix 1.

### *Test Excavation Results*

#### **Site 23BT1130**

As discussed above, the report of the geophysical survey interpreted site 23BT1130 as a "complex series of intact historic archaeological resources related to the Toothman farmstead" (De Vore 2009:13). Figure 1, as noted previously, postulates two rectangular structures south-west of the stone-lined well or cistern that occupies the site today. This map also shows a large, linear excavation to the northwest of the well/cistern, interpreted as a silage trench (storage of animal fodder). A "large depression," ostensibly excavated, is indicated at the southwest corner of the area shown in Figure 1.

The soil auger sampling transect and excavation pits described earlier (Test Excavation Methods) probed the sub-surface archaeological deposits associated with the larger of the postulated structures, and the depression at the southwest corner of the mapped area. Excavation results indicate the possibility of one or more historic structures at site 23BT1130, perhaps as early as the time frame of the Toothman farm (ca. 1860-1865), but evidence of a Civil War-era farm house is slight. Moreover, the ability to discern such an occupation is hampered by severe damage to the site's archaeological context by modern earth-moving activities.

The stone-lined well/cistern extant on site 23BT1130 is consistent with a 19$^{th}$ or early 20$^{th}$ century occupation(s). This feature is presumably in close proximity to a structure(s). At the same time, the pattern of artifacts revealed by the current study offers little evidence of a 19$^{th}$ century domestic occupation at 23BT1130. Overall, relatively few artifacts referable to a domestic occupation at 23BT1130 were recovered, as shown in Appendix 1 (artifact catalog). Frequently, historic sites yield relatively large numbers of domestic artifacts, including ceramic, metal and glass materials (numbering in the tens to hundreds per cubic meter of excavated site matrix). No such pattern was found at 23BT1130. For example, only seven ceramic fragments of tableware (refined earthenware) were recovered (Appendix 1). Ten glass container fragments were recovered (Appendix 1). Nails tend to be numerous at historic sites that once hosted structures. The record at 23BT1130 in this regard is scant. Eight wire nails and 2 square (cut) nails were recovered (Appendix 1). Based on these numbers, the ceramic, glass and metal artifacts provide weak evidence of a domestic occupation.

Determining the age of the occupation of 23BT1130 is difficult, based on the paucity of artifacts recovered from the site. Based on the available evidence, the artifact chronology at the site offers little support for a Civil War-era occupation. Square (cut) nails tend to be one of the most pervasive time-sensitive metal artifacts found by archaeologists on structure-bearing 19th century archaeological sites, with square nails declining after the 1880s following the introduction of the types of wire nails used today (IMACS User's Guide, 2001:470.3). Based on the percentage of wire nails vs. square nails found at the site, the IMACS User's Guide would place the date of occupation (based entirely on nails) at 1895 or later. Owing to the fact that use of square nails spanned most of the 19th century, "nails dates" yield greater chronological precision when combined with other time-sensitive classes of artifacts. Lacking such corroborative evidence at 23BT1130, the two square nails found at the site offers little support for the existence of a Civil War-era structure at this location.

A number of studies conducted over the last 40 years show that window glass fragments offer one of the most robust means of dating 19th century structures. Thickness of window glass (owing to means of manufacture) progressively increased during this time period (Moir, 1987; Weiland 2009:29). Several investigators have developed mathematical formulas (regression analysis) which estimate the age of glass manufacture, based on the thickness of glass fragments (see Schoen 1990, Day 2001 and Weiland 2009 for a comparison of these methods). Testing of these formulas with glass of known manufacture shows that 19th century window glass fragments can be dated accurately within known error ranges (ca. +/- seven years; see Day 2001; Weiland 2009: 31). As noted by Weiland (2009), the glass dating protocols developed by Moir

(1977, 1987) are widely used by researchers owing to their rigorous criteria for selection of glass samples. The present investigation utilized Moir's methods for dating window glass, outlined in Figure 5 on the following page.

The sample of artifacts from 23BT1130 yielded a single fragment of flat glass, measuring 3.90 mm in thickness, placing this fragment most likely in a 20th century time range, if indeed it is window glass at all. Moir (1987) states that flat glass thicker than 3 mm is quite possibly a section of a panel bottle, and cannot be reliably construed as window glass. The small sample of flat glass from 23BT1130 offers scant evidence for the existence of a domestic structure(s), at least a structure(s) containing glass windows (some 19th century structures did not). This information can be compared to three glass container fragments recovered from 23BT1130 of manganese decolorized glass, a glass type with a time range of about 1880 to 1920 (United States Department of the Interior, 2008).

Testing of 23BT1130 yielded important information about the site's archaeological context. This work revealed abundant evidence of the disturbance of soil/sediments at 23BT1130, including extensive mixing and mottling of deposits, incorporating materials of relatively recent age. The latter include a fragment of plastic and a fragment of a modern pencil, both recovered 10-20 cm below the surface (Appendix 1). These findings are not surprising, perhaps, in light of abundant evidence of earth-moving on and around site 23BT1130. The obvious example of such earth-disturbing activity is the massive silage trench indicated in Figure 1. Since this trench is excavated more than one meter into bedrock, it seems likely that it was created with modern earth-moving equipment. Structures of this kind are fairly common on 20th

| | |
|---|---|
| **Mean/Mode** | Mean |
| **Applicable Date Range** | 1810 to 1920 |
| **Number of Sites Used to Produce Method** | 45 |
| **Location of Sites** | South and northeast U.S., Texas |
| **Increment of Measurement** | 0.01 mm;<br>1 measurement (assumed) |
| **Region of Application** | South and northeast U.S., many sites in Texas |
| **Sample Sizes** | 15 to 20 pieces of glass can produce viable results, above 30 pieces is recommended for reliable results;<br>Largest sample noted was 659 pieces |
| **Strictures and Exclusions** | Select best possible context of glass from site, as opposed to seeking larger samples:<br>Foundation lines are best;<br>Scatters immediately next to walls are acceptable;<br>Only when glass from foundation lines or in scatters next to walls is not available should other glass be used;<br>Exclude glass from trash pits;<br>Confirm the structure was built after 1800 and before 1920;<br>Confirm the glass is flat by placing the glass on a flat surface and attempting to "rock" it back and forth by placing light pressure on opposite edges;<br>Confirm the glass is flat by letting light play across it;<br>Make sure the sample is window glass by eliminating potential bottle glass, mirror, or decorative glass shards:<br>Confirm glass is actually flat on both surfaces;<br>Confirm that glass bears no ripple marks which would indicate it was made in a bottle mold;<br>Confirm glass shards do not have beveled edges which would indicate the glass was decorative;<br>Confirm glass does not have silver backing indicating it is from a mirror;<br>Closely inspect glass that is pink or perfectly clear as it has a high probability of not being window glass;<br>Discard data when all pane thicknesses are greater than 3.2 mm |
| **Data Processing** | Collect measurements from a subsample of site according to sampling criteria, average all the values and insert that value in place of the *TH* variable in Moir's regression formula |
| **Dating Formula** | $ID = 84.22\ (TH) + 1712.7$<br>where $ID$ = date of site construction ($\pm 7$ years)<br>$TH$ = thickness in 0.01 mm |

*Figure 5: Moir's window glass dating protocols from Weiland 2009:37*

century farms, where farmers had increasing use of heavy equipment capable of such large excavations. It seems likely that the area for several meters around the silage trench, including the area of the geophysical survey, was severely disturbed by such activities. The mixing of modern materials, such as plastic and pencils, into the resulting fill is explicable on the basis of this kind of earth moving activity. Similarly, soil auger testing of the large depression indicated in the southwest corner of Figure 1 revealed mottled deposits characteristic of ground disturbance, but no artifacts. This site

feature seems likely the result of the same type of earth-moving activities that produced the silage trench.

Unfortunately, any possible structural features of 19th century buildings that may have occupied 23BT1130 have likely been destroyed by modern earth-moving activities in the area of the silage trench. Any possible associated archaeological deposits appear to have suffered a similar fate. Based on the artifact evidence above, admittedly scanty, perhaps the most likely type of historic occupation at the site was a late 19th century or 20th century locus of farming activities secondary to domestic occupation (out buildings, stock holding areas, etc.). The fence staple and fence wire fragments recovered from 23BT1130 may strengthen this interpretation (Appendix 1).

**Site 23BT1131**

Site 23BT1131, as discussed earlier, was interpreted by the geophysical investigation as the Methodist Episcopal Church recorded in the plat map of 1875, and a possible church cemetery to the north (Figure 2). Readily visible stone foundations were interpreted as the location of the church (Figure 2). As discussed earlier in the section on Test Excavation Methods, a north-south soil auger transect was excavated, bisecting the foundations, and the area of the postulated cemetery. Archaeological test pits followed the auger sampling, focusing on the foundations, since it was the foundations that yielded the greatest evidence of artifacts indicative of the site's occupational history.

Results of testing indicate a more complex history of occupation than is suggested by the geophysical report and some interpretations of the site based on

historical references (see Assessment and Recommendations section below). While none of the results obtained by this study precludes the existence of the church postulated by the geophysical survey, they point to the probable existence of a Civil War-era structure on the stone foundations at 23BT1131, pre-dating the church. These data suggest a multi-component archaeological site (more than one period of occupation), rather than a single late 19th century church occupation, as assumed by some researchers.

Two classes of artifacts from 23BT1131, nails and flat glass fragments, yielded the bulk of artifacts recovered from 23BT1131 (Appendix 1). Nearly all of these were recovered from test pits located on or immediately adjacent to the rectilinear foundations shown in Figure 2. Figures 6 and 7 present revealing evidence of the site's occupational history.

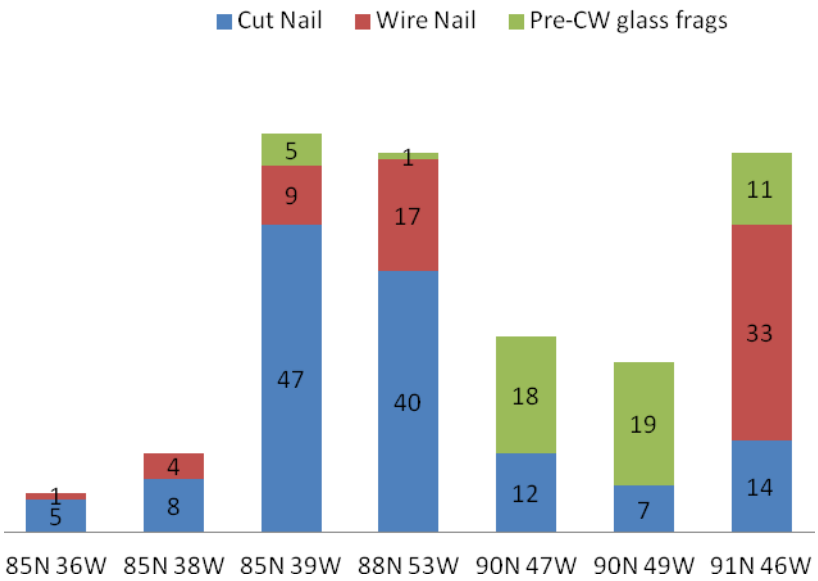


*Figure 6. Number of Cut and Wire Nails by excavation pits, site 23BT1131*

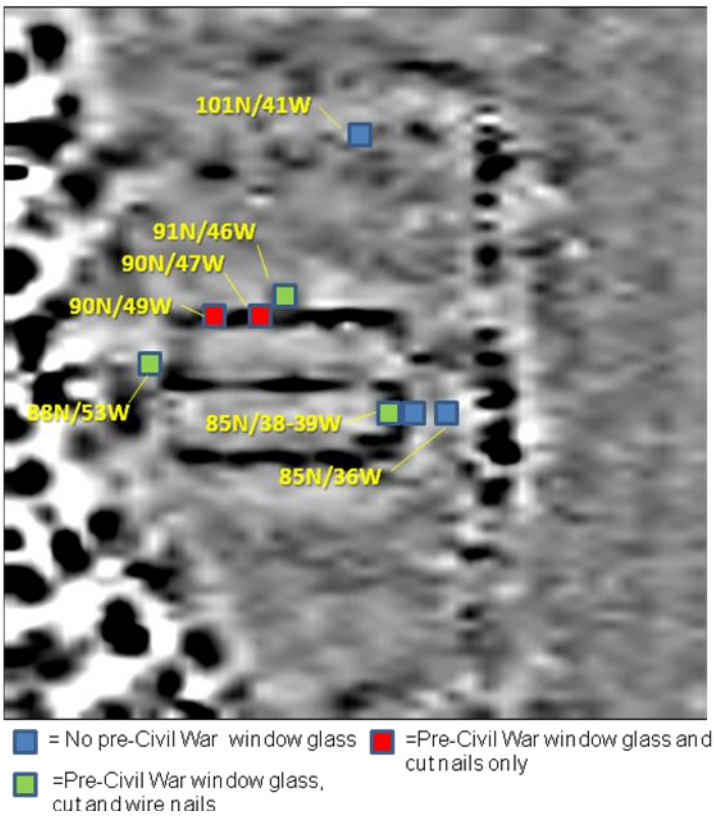


*Figure 7. Distribution of pre-Civil War flat glass fragments and nails from archaeological test pits, site 23BT1131. Note rectilinear stone foundation near the center of mapped area.*

Figure 6 plots the frequency of nail types (square and wire) and flat glass fragments of pre-Civil War age for the archaeological test pits flanking 23BT1131's stone foundations. Fifty-four specimens of flat glass (Appendix 1) from 23BT1131 are of pre-Civil War age, a sample size adequate for reliable age estimation (see Figure 5). Moreover, as recommended by the Moir dating method, the 23BT1131 flat glass sample was recovered from a structure foundation, and not compromised by mixing with flat glass samples from other archaeological contexts. The 23BT1131 sample thus conforms well to the requirements for an accurate glass-dating study. These findings lend considerable support to the conclusion that a pre-Civil War structure existed on the foundations at 23BT1131. While it is conceivable, perhaps, that pre-Civil War glass

stocks were used following the war or salvaged from pre-Civil War structures, given the history of Civil War era destruction in the County, the most parsimonious interpretation of 23BT1131's window glass data favors the existence of an occupational component circa the Civil War.

Other data point in the same direction. Figure 7 shows the distribution of nail types and glass in relation to the rectilinear stone foundations at site 23BT1131. In Figure 7, two adjacent archaeological test pits yielded pre-Civil War glass fragments and only square nails (90N/47W and 90N/49W). The absence of wire nails in these contexts suggests the possibility of a structure pre-dating the use of wire nails; i.e., pre-dating the late 19$^{th}$ century. Pits containing both square and wire nails may be explicable in terms of the mixing of glass and nail types resulting from construction of a post-Civil War structure(s).

Unfortunately, few other types of artifacts were recovered from 23BT1131 that might shed light on its age and the nature of the site's occupation(s). In this regard, 23BT1131 is similar to 23BT1130 in yielding a scanty record of artifact deposition, as compared to the relatively abundant glass, metal, ceramic and other artifacts associated with many 19$^{th}$ century archaeological sites. However, there may be clues in the 23BT1131's history of occupation that help us to understand this ostensible anomaly. This point is discussed in the following report section on Assessment and Recommendations.

As discussed previously, the geophysical survey interpreted some of the anomalies mapped north of the stone foundation as possible graves (De Vore 2009:13). Soil auger testing was conducted on the larger of these anomalies with negative results.

Graves generally produced robust archaeological signatures, notably visible evidence of disturbance to the substrates into which the graves were excavated. No such evidence was revealed by the present study. While the presence of graves cannot be completely excluded on the basis of the present research, no evidence was found in support of the existence of a graveyard on 23BT1131. Here, it might be noted that bedrock exists within about one meter of the surface (this can be seen, for example, in the silage trench at 23BT1130). Any graves excavated at 23BT1131 would have confronted a considerable task in digging through such bedrock with and tools. While this challenge could have been overcome with sufficient effort, it may have proven easier to bury the dead at other locations than 23BT1131.

The archaeological context of site 23BT1131, unlike 23BT1130, appears to be largely intact. A single fragment of plastic was recovered from 23BT1131 in the excavated sample (Appendix 1). However, this specimen was recovered from in the 0-10 cm level, possibly reflecting deposition on the surface of the site. Apart from this discovery, the archaeological context of the site appears to have escaped significant damage from modern earth-moving activities.

### *Assessment and Recommendations*

#### **Assessment**

The data presented in this report help to construct an increasingly detailed picture of the possible locations of the Toothman farm house and Fort Africa. This picture suggests that the historical identities previously attributed to sites 23BT1130 and 23BT1131 need to be fundamentally re-evaluated. Here, it is important to recognize

that previous investigations of the study area followed from an initial interpretive line: Site 23BT1130 was the most likely location of the Toothman house, while site 23BT1131 was a later and unrelated church. The geophysical and metal detector studies (De Vore 2009 and Thiessen 2009) were predicated on this interpretation; perhaps necessarily so, given the paucity of available archaeological information when these studies were conducted. The following suggests, however, that this model needs significant revision:

## Was Site 23BT1130 the Toothman House/Fort Africa?

Previous investigations, as we have seen, identified site 23BT1130 and the most likely location of the Toothman house. Tabor's research appears to be the first to identify the existence of 23BT1130, and link the site specifically to the Toothman place. Tabor's (2001) insightful volume, *Skirmish at Island Mound*, offers an historical reconstruction of the events surrounding the battle, including occupation of Fort Africa. Tabor's research notes on this volume (http://islandmound.tripod.com/research.htm) identify two archaeological sites in the study area; locations subsequently identified by the geophysical and metal detector surveys as the Methodist Episcopal Church site (23BT1131) and the Toothman house site (23BT1130):

> Ironically, the exact location of the Toothman Farm was a matter of some debate, even here in Bates County. It would appear (based upon my experience with the records) that when the county's deed and land records were indexed the Toothman farm was overlooked. A thorough search of the microfilmed deeds (with the help of very talented and experienced geneologists in Bates County) eventually turned up the entry for the Toothman's purchase of their farm. With the legal description of the Toothman farm in hand, I next endeavored to locate Platte [sic] maps from the 1850s and 1860s that might show where the Toothman house was located upon the farm. Unfortunately, the earliest available Platte

> maps are from the 1870s (thanks in part to Jim Lane and his Kansas Brigade in 1861). The 1870s Platte maps showed a structure located in the extreme northwest corner of the Toothman farm, but the structure was labeled with an "M.E." denoting a Methodist Episcopal Church [23BT1131]. *Conversations with people much more knowledgeable into 19th Century life than I, informed me that it would have been very uncommon for an existing home to be converted into a church in post-Civil War Bates County.* In fact, it would seem that a neighborhood desiring a church would go through great pains to erect a new, pristine structure. So where was the Toothman house? The location of the house became more critical as I my research uncovered more contemporary accounts of the engagement, which spoke of movements, distances, and directions in relation to the Toothman house. The current landowners were kind enough to give me access to their land and I was finally able to definitively (at least in my mind) locate the site of the Toothman house. There in a cluster of trees surrounded by acres and acres of fields is the old well that served the occupants of the house [23BT1130]. (emphasis added)

This explanation notably excludes the church site as a likely location of the Toothman house/Fort Africa: "Conversations with people much more knowledgeable into 19th Century life than I, informed me that it would have been very uncommon for an existing home to be converted into a church in post-Civil War Bates County." As we saw earlier, this interpretation has proven highly consequential, shaping the interpretative framework of the geophysical and metal detector studies, both of which essentially reinforce Tabor's conclusions.

In Tabor's defense, the inferences described in the research notes may not have been intended as a final word about the identity of site 23BT1131, but rather as a working hypothesis. Unfortunately, conjectures of this type have a way of becoming demonstrated reality. They also illustrate the challenge presented by mixed data, mentioned at the beginning of this report. The challenge, once again, is weighing the reliability of diverse kinds of information, including archaeological, documentary and oral (folk) histories.

Studies of historical archaeology show that the most problematic of these often is the "memory culture" of persons long removed from historical events of interest. While such folk histories are sometimes fervently believed, their validity frequently remains imponderable, unless verified on the basis of other, more tangible lines of evidence. In contrast to oral history, however, the archaeological record contains physical traces of events as they actually transpired. As such, these are amenable to empirical testing. As shown below, the available archaeological data from 23BT1130 poses a significant challenge to identification of this site as the Toothman house/Fort Africa.

Linking the Toothman house to site 23BT1130 is complicated by several factors. Many farms did not consist of a single domestic structure, but rather a complex of constructions that included out buildings, barns, livestock holding pens and other facilities dispersed over the farm property. Each of these produces potential archaeological signatures. The existence of a well, building foundations or other archaeological features does not necessarily imply that these were necessarily associated with a domestic structure. In addition, land holdings often have multiple owners across time, each potentially imposing another layer of archaeological signatures on the property. Such layering, common to 19th century historical sites, can also include re-occupation of building sites, including destruction and rebuilding of new structures or modification of existing structures. Historical records indicate that the acreage containing the Toothman farmstead had at least three 19th century owners (Tabor 2001), suggesting the distinct possibility of a rather complex record of archaeological deposition in the lands now encompassing the Site. Based on these possibilities, 23BT1130 potentially represents a wide range of farm-related activities

spanning the mid-19th century to well into the 20th century. Another problem is extensive damage to the site's archaeological context by modern earth-moving activities. Yet another difficulty is the small sample of artifacts recovered from the site. These limitations acknowledged, archaeological data from the present investigation, discussed earlier in the report, offer little support for a Civil War-age occupation 23BT1130. These data suggest a late 19th to early 20th century occupation, perhaps for activities related to farming but not necessarily a domestic structure. Findings of the metal detector survey are consistent with this conclusion. For example, Thiessen et al. (2009:82-83) comment:

> Metal detecting did locate significant concentrations of metal objects in and around the presumed Toothman house site [23BT1130]. In the general area outside the tree grove inventory work produced a number of artifacts related to domestic activities, including a stove finial in the area north and east of the tree line. *The rather linear, southeast to northwest orientation of the domestic debris, and the dating of the debris to the late 19th century suggest the items may likely be associated with the salvage of the church rather than a direct association with the purported Toothman house.* Artifacts found in the tree grove and around the suspected house site include potential mid-19th century items, a shovel, a button, and a tinware milk pan. Other materials including some glass and ceramics found near metal objects suggest a late 19th or early 20th century deposition for some materials, possibly the use of the area as a trash midden. (emphasis added)

Interesting here is the inference that the linear debris field is likely associated with the church site, 23BT1131, about 100 meters to the northwest. This interpretation offers no explanation for why salvaging materials from the church, a considerable distance away, would produce a linear distribution of debris adjacent to 23BT1130. Is there a more direct and logical explanation of this pattern? An important clue is reference to the "rather linear, southeast to northwest orientation" of the debris. One of the most apparent features of site 23BT1130 is the massive silage trench shown in Figure 1, as

well as extensive earth moving in and around 23BT1130. Earth-moving activities of this kind frequently produce linear "push piles" of debris. Deposits of this kind around 23BT1130 are a logical product of displacing the 19th and 20th century artifacts found in 23BT1130 during archaeological testing. It seems likely, then, that 23BT1130 represents a late 19th and 20th century occupation, massively disturbed by earth-moving activities. Inferences by Thiessen et al. (2009:82-83) that 23BT1130's post-Civil War artifacts derive from the church, and are not characteristic of 23BT1130 itself, follows Tabor's interpretations. Empirical archaeological patterns described above cast considerable doubt on these interpretations.

Based on these findings, site 23BT1130 should be re-evaluated as a possible candidate for the Toothman house/Fort Africa. Based on the data from the metal detector survey and the present study, 23BT1130 is not a promising candidate for the Toothman farm/Fort Africa.

**Is there evidence of the Toothman House/Fort Africa?**

The comments above about the Site's potentially complex archaeological record are particularly pertinent to the assessment of site 23BT1131. Historical records, as noted previously, place a Methodist Episcopal Church on the site of 23BT1131 in the late 19th century. There is little reason to doubt that this church once occupied the site, but was this the sole occupational component? Could site 23BT1131 have been occupied earlier, during the Civil War, for a different purpose? As we saw earlier, Tabor's interpretation of the site ruled out such a possibility. Subsequent investigators, including the geophysical survey and metal detector survey, adopted this interpretation

and, as we have seen, interpreted the evidence collected by these studies in the light of Tabor's conclusion.

Setting aside this earlier interpretive line, what picture emerges of site 23BT1131 from archaeological testing? Based on the evidence reviewed earlier (Figures 6 and 7), it appears likely that a structure existed during the Civil War on the stone foundations of 23BT1131. If so, the Methodist Episcopal Church represents post-war reuse of these foundations.

On the basis of current evidence, it is difficult to discern the nature of this structure. Descriptions of the Toothman house are frustratingly rare and vague. However, Tabor's research is valuable in this regard. In other comments on his Island Mound research, Tabor notes that the Toothman house was of "double log" construction. This observation is interesting because double-pen log structures were a popular 19$^{th}$ century house style, particularly favored by Southerners such as the Toothmans (who moved to Bates County from Virginia, Tabor 2001). Houses of this type had a rectangular plan featuring two or four rooms (if two story), sometimes separated by a breeze way ("dog trot") (see http://www.dnr.mo.gov/shpo/nps-nr/07000576.pdf for a Missouri example). The foundations at 23BT1131 are consistent in size and configuration of such a structure (ca 10 x 15 meters).

If the foundation at 23BT1131 marks the location of the Toothman house, it is curious, as noted earlier, that archaeological testing recovered only small samples of artifacts associated with domestic occupations (ceramic, glass, metal objects, etc.). This pattern may not be as aberrant as it may appear, however. First, the documentary evidence shows that the Toothman house may have been occupied for a relatively short

period of time, perhaps as little as one or two years. This conclusion derives from the following chronology: Enoch and Christiana Toothman purchased the property in February, 1860 (Tabor 2001). It is not clear whether a house existed on the property at the time of the sale. In October, 1862, the house was occupied during the Battle of Island Mound. If the house was constructed after purchase of the land, it may have existed for a year or less by the time it occupied as Fort Africa. We do not know if the Toothman family remained in the house after the battle, but it seems virtually certain the house was destroyed by enforcement of General Order 11 in August, 1863. By any account, the house seems unlikely to have been occupied for more than three years. In such a short span of time, we should perhaps expect relatively little deposition of archaeological materials, particularly during a period of wartime scarcity. Another factor to consider is the small extent of archaeological testing to date. As discussed earlier, less than one percent of 23BT1131 has been examined for archaeological deposits. The possibility remains that trash and other materials deposited during an occupation by the Toothman family have yet to be found.

The same considerations may apply to discovery of artifacts directly associated with the Battle of Island Mound. The troops that occupied the Toothman farm, estimated to be about 200 men, were in this location for three days. At low levels of archaeological sampling, the probably of recovering artifacts specifically referable to this force is probably small.

The role of site 23BT1131, aka the church site, in the Battle of Island Mound should be re-evaluated in light of the evidence presented above, and recognized as a possible location of the Toothman farm/Fort Africa. While the data currently available

do not establish this connection with certainty, the site cannot be excluded at this time as a candidate for the Toothman farm/Fort Africa. Additional archaeological investigation is required to strengthen this possibility.

***Recommendations***

Based on the present investigation, the roles assigned to archaeological sites 23BT1130 and 23BT1131 by previous investigations should be comprehensively re-evaluated. The notion that 23BT1130 is the site of the Toothman house/Fort Africa, and that 23BT1131 is solely the location of a post-Civil War church, have little support in the available archaeological evidence. Indeed, this evidence suggests that it is more likely that the historical roles assigned to these sites by earlier investigators such be reversed; i.e., 23BT1131, aka the church site, is a more likely candidate for Fort Africa than 23BT1130. Based on the poor condition of site 23BT1130's archaeological context, it is doubtful that additional archaeological investigation of the site will yield useful results. This is not the case, however, for site 23BT1131. The archaeological context of this site appears to be in largely intact. Additional archaeological investigation at this site is warranted, particularly aimed at:

(a) Confirming occupation during a Civil War time frame;

(b) Finding and analyzing possible deposits of domestic refuse associated with a domestic occupation;

(c) Finding and analyzing structural features or artifacts that can shed light on the occupation of 23BT1131 over time.

Additional archaeological investigation of site 23BT1131 is recommended to determine if it was a farm during the Civil War, with characteristics consistent with the Toothman house and Fort Africa. This remains an important research objective. Yet, it is best perhaps to avoid too much emphasis on historical realism. In the end, archaeological and historical analysis may not yield certainty, but rather locations more or less likely to have been Fort Africa. But does this matter for the intended purposes of the Site? It should be remembered that the Site was created to commemorate the historic actions the 1st Kansas and Confederate forces who fought the Battle of Island Mound, and more generally to inform current generations of Americans about the large and significant role Missouri played in the American Civil War. The lessons to be learned from this history do not require reference to any specific physical location. Recreation of an historical context in the Site, representative of its time and place, may be an appropriate way to achieve the Site's goals. Interpretation of archaeological site 23BT1131 may well be suitable for this purpose.

With the creation of the Site and archaeological investigation of the property, the Site may become the target of relic hunters, metal detector enthusiasts or others who can inflict damage on the Site's archaeological remains. Regular monitoring of the Site to prevent such damage is advisable.

***Acknowledgements***

An endeavor of this scope cannot be completed without the help and cooperation of many other individuals. First and foremost, we would like to acknowledge the help and cooperation of everyone associated with the Bates County Historical Society and the Bates County History Museum. In particular, we would like to thank Donna Gregory, Peggy Buhr and Doug and Nita Thompson. Their past and continued support of archaeological work and historic preservation in Bates County is critical to the success of projects such as these.

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***References Cited***


-----.

2001 IMACS User's Guide: 470-Nails. http://www.anthro.utah.edu/IMACs/470-Nails.pdf (accessed 11/12/2011).

Day, Grant L.

2001 Window Glass Dating: When was McConnell's Homestead Built? Paper presented at the 4th Annual Meeting South Central Historical Archaeology Conference, Little Rock Arkansas.

De Vore, Steven L.

2009 *Geophysical Investigations at the Toothman Farmstead (Site 23BT1130) and the Methodist Episcopal Church (Site 23BT1131) at the Battle of Island Mound State Historic Site, Bates County, Missouri.* Submitted to the Archaeologist, Missouri Department of Natural Resources, Division of State Parks

Jurney, David H., Randall W. Moir and William A. Westbury

1987 "Appendix D: The Written Word: Expectations and Realizations." In *Pioneer Settlers, Tenant Farmers, and Communities: Richland Creek Technical Series, Vol. V*, ed. Randall W. Moir and David H. Jurney, 293-304. Archaeological Research Program, Institute for the Study of Earth and Man: Southern Methodist University.

Moir, Randall W.

1977 Window Glass: A Statistical Perspective. Manuscript on file, Department of Anthropology, Southern Methodist University, Dallas, Texas.

1987 "Socioeconomic and Chronometric Patterning of Window Glass." In *Pioneer Settlers, Tenant Farmers, and Communities: Richland Creek Technical Series, Vol. V*, ed. Randall W. Moir and David H. Jurney, 73-81. Archaeological Research Program, Institute for the Study of Earth and Man: Southern Methodist University

Schoen, Christopher M.

1990 "Window Glass on the Plains: an Analysis of Flat Glass Samples from Ten Nineteenth Century Plains Historic Sites," in *Central Plains Archaeology* 2(1): 57-90.

Tabor, Chris

2001 *The Skirmish at Island Mound, Mo: The First Battle by an African-American Regiment during the Civil War.* The Blue and Grey Book Shoppe, Independence, Missouri.

Thiessen, Thomas D., Steve J. Dasovich, and Douglas D. Scott
2009 "The Men Fought Like Tigers": The Skirmishes at Island Mound, Bates County, Missouri, October 27-29, 1862. Report prepared for Missouri Department of Natural Resources, Jefferson City.

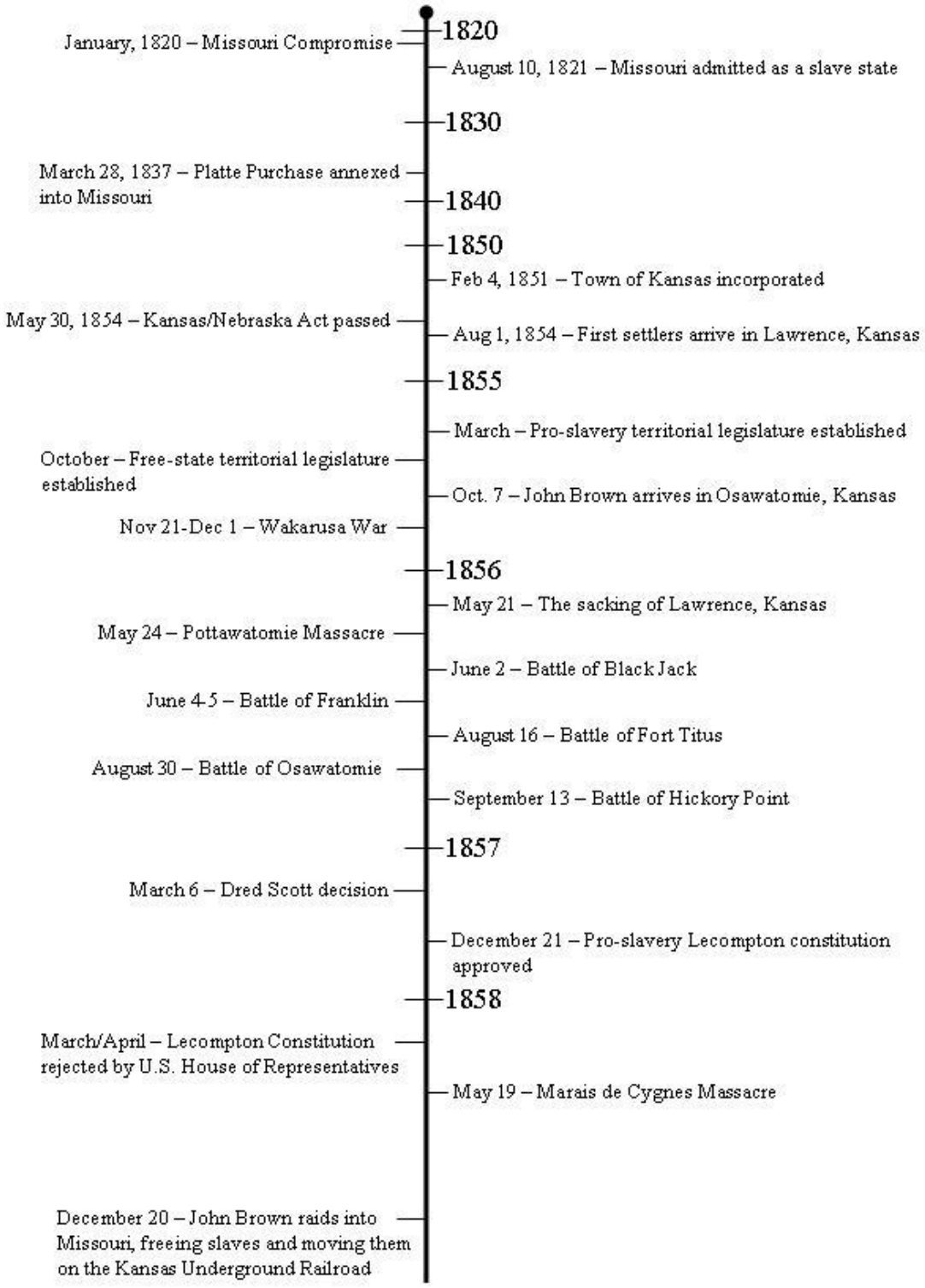
Weiland, Jonathan
2009 A Comparison and Review of Window Glass Analysis Approaches in Historical Archaeology. *Technical Briefs in Historical Archaeology* 4:29-40.

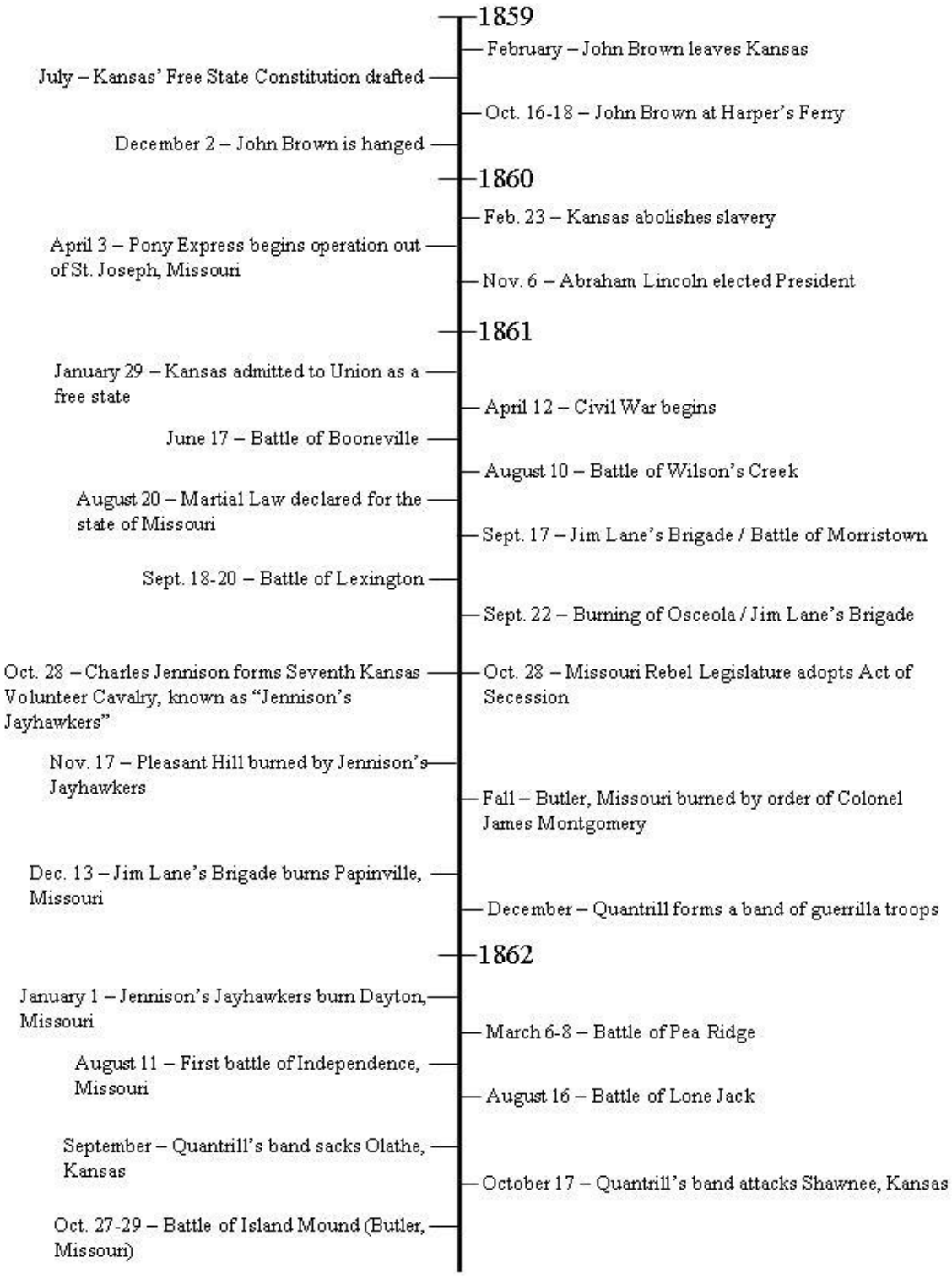
United States Department of the Interior – Bureau of Land Management
2008 Historic Glass Bottle Identification & Information Website. http://www.sha.org/bottle/index.htm (accessed 11/12/2011).

## Appendix E: Timeline and Maps of Related Events

The following pages include a general timeline of major events related to the Missouri/Kansas Border war and the Civil War in general, where deemed appropriate. Of course, not all major engagements of the Civil War are included, nor all of the specific events related to the Missouri/Kansas Border War. The events discussed throughout this dissertation are included, as well as others which provide additional context for the type and frequency of conflict in the area. This timeline starts with the Missouri Compromise of 1820, and ends with the ratification of the 13th Amendment in 1865.

In addition, a series of maps are provided which shows the location of the events related to the Missouri/Kansas Border War and General Order No. 11. Again, not all of the events listed on the timeline are included on the map, but the general location of the most relevant are indicated. The first map is an outline map of the United States, indicating the location of the Missouri/Kansas Border War area. The second map shows the Missouri counties included in General Order No. 11. The third map shows the possible location of the Fort Scott Military Road, and its relation to the location of West Point, Missouri (taken from Barry, 1942 – with additional descriptions added). The fourth map includes the location of selected sites and events in Missouri and Kansas discussed in the text and included in the timeline. The final map is a closer view of selected events and locations in Bates County and adjacent areas. All locations are approximate.


1820
January, 1820 – Missouri Compromise
August 10, 1821 – Missouri admitted as a slave state
1830
March 28, 1837 – Platte Purchase annexed into Missouri
1840
1850
Feb 4, 1851 – Town of Kansas incorporated
May 30, 1854 – Kansas/Nebraska Act passed
Aug 1, 1854 – First settlers arrive in Lawrence, Kansas
1855
March – Pro-slavery territorial legislature established
October – Free-state territorial legislature established
Oct. 7 – John Brown arrives in Osawatomie, Kansas
Nov 21-Dec 1 – Wakarusa War
1856
May 21 – The sacking of Lawrence, Kansas
May 24 – Pottawatomie Massacre
June 2 – Battle of Black Jack
June 4-5 – Battle of Franklin
August 16 – Battle of Fort Titus
August 30 – Battle of Osawatomie
September 13 – Battle of Hickory Point
1857
March 6 – Dred Scott decision
December 21 – Pro-slavery Lecompton constitution approved
1858
March/April – Lecompton Constitution rejected by U.S. House of Representatives
May 19 – Marais de Cygnes Massacre
December 20 – John Brown raids into Missouri, freeing slaves and moving them on the Kansas Underground Railroad


1859
February – John Brown leaves Kansas
July – Kansas' Free State Constitution drafted
Oct. 16-18 – John Brown at Harper's Ferry
December 2 – John Brown is hanged
1860
Feb. 23 – Kansas abolishes slavery
April 3 – Pony Express begins operation out of St. Joseph, Missouri
Nov. 6 – Abraham Lincoln elected President
1861
January 29 – Kansas admitted to Union as a free state
April 12 – Civil War begins
June 17 – Battle of Booneville
August 10 – Battle of Wilson's Creek
August 20 – Martial Law declared for the state of Missouri
Sept. 17 – Jim Lane's Brigade / Battle of Morristown
Sept. 18-20 – Battle of Lexington
Sept. 22 – Burning of Osceola / Jim Lane's Brigade
Oct. 28 – Charles Jennison forms Seventh Kansas Volunteer Cavalry, known as "Jennison's Jayhawkers"
Oct. 28 – Missouri Rebel Legislature adopts Act of Secession
Nov. 17 – Pleasant Hill burned by Jennison's Jayhawkers
Fall – Butler, Missouri burned by order of Colonel James Montgomery
Dec. 13 – Jim Lane's Brigade burns Papinville, Missouri
December – Quantrill forms a band of guerrilla troops
1862
January 1 – Jennison's Jayhawkers burn Dayton, Missouri
March 6-8 – Battle of Pea Ridge
August 11 – First battle of Independence, Missouri
August 16 – Battle of Lone Jack
September – Quantrill's band sacks Olathe, Kansas
October 17 – Quantrill's band attacks Shawnee, Kansas
Oct. 27-29 – Battle of Island Mound (Butler, Missouri)

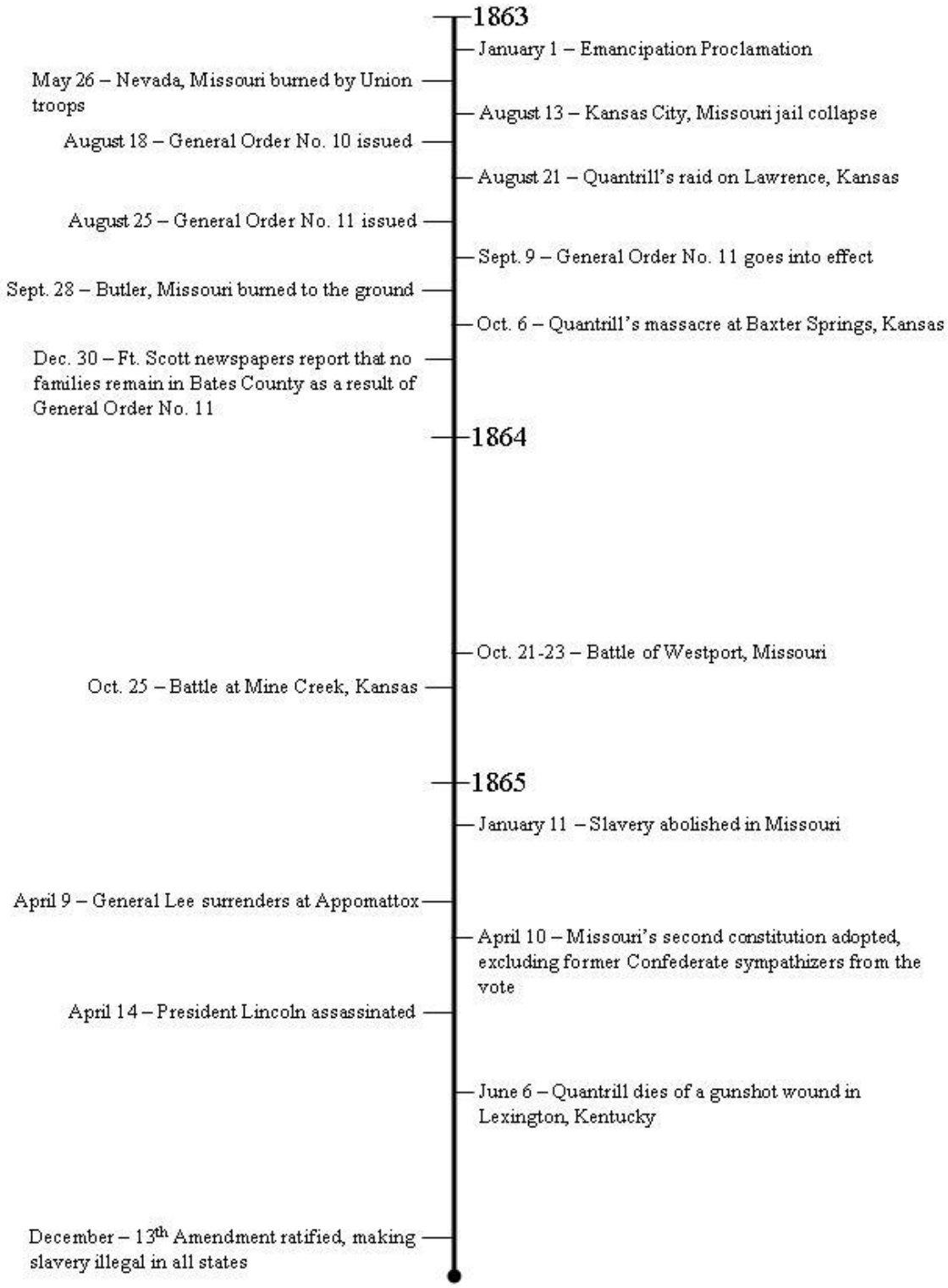

1863
January 1 – Emancipation Proclamation
May 26 – Nevada, Missouri burned by Union troops
August 13 – Kansas City, Missouri jail collapse
August 18 – General Order No. 10 issued
August 21 – Quantrill's raid on Lawrence, Kansas
August 25 – General Order No. 11 issued
Sept. 9 – General Order No. 11 goes into effect
Sept. 28 – Butler, Missouri burned to the ground
Oct. 6 – Quantrill's massacre at Baxter Springs, Kansas
Dec. 30 – Ft. Scott newspapers report that no families remain in Bates County as a result of General Order No. 11
1864
Oct. 21-23 – Battle of Westport, Missouri
Oct. 25 – Battle at Mine Creek, Kansas
1865
January 11 – Slavery abolished in Missouri
April 9 – General Lee surrenders at Appomattox
April 10 – Missouri's second constitution adopted, excluding former Confederate sympathizers from the vote
April 14 – President Lincoln assassinated
June 6 – Quantrill dies of a gunshot wound in Lexington, Kentucky
December – 13th Amendment ratified, making slavery illegal in all states


*Figure E.1: United States Map with Border War Area*


*Figure E.2: Counties Included in General Order No. 11*

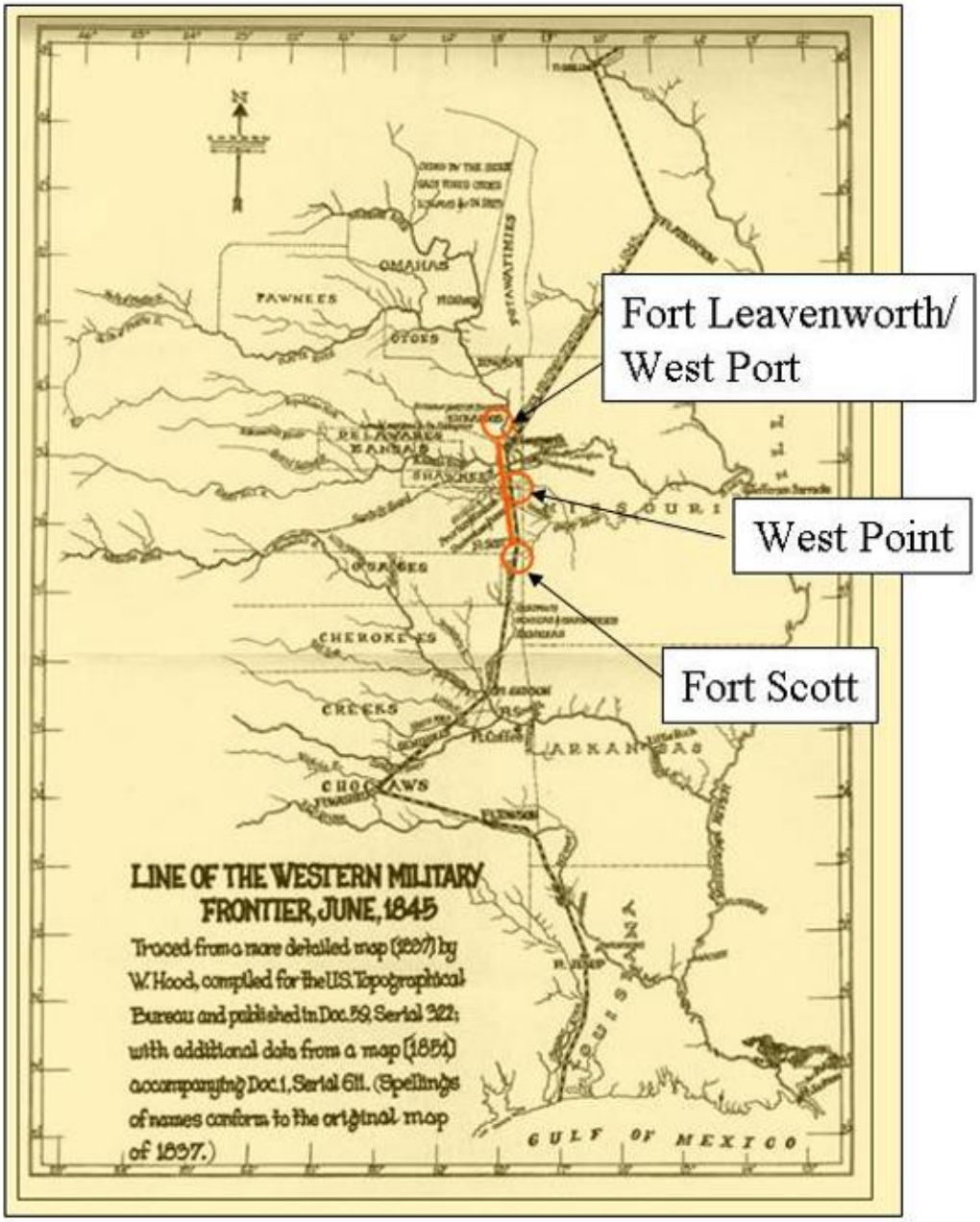



*Figure E.3: Line of the Western Military Frontier – 1845 (taken from Barry, 1942)*

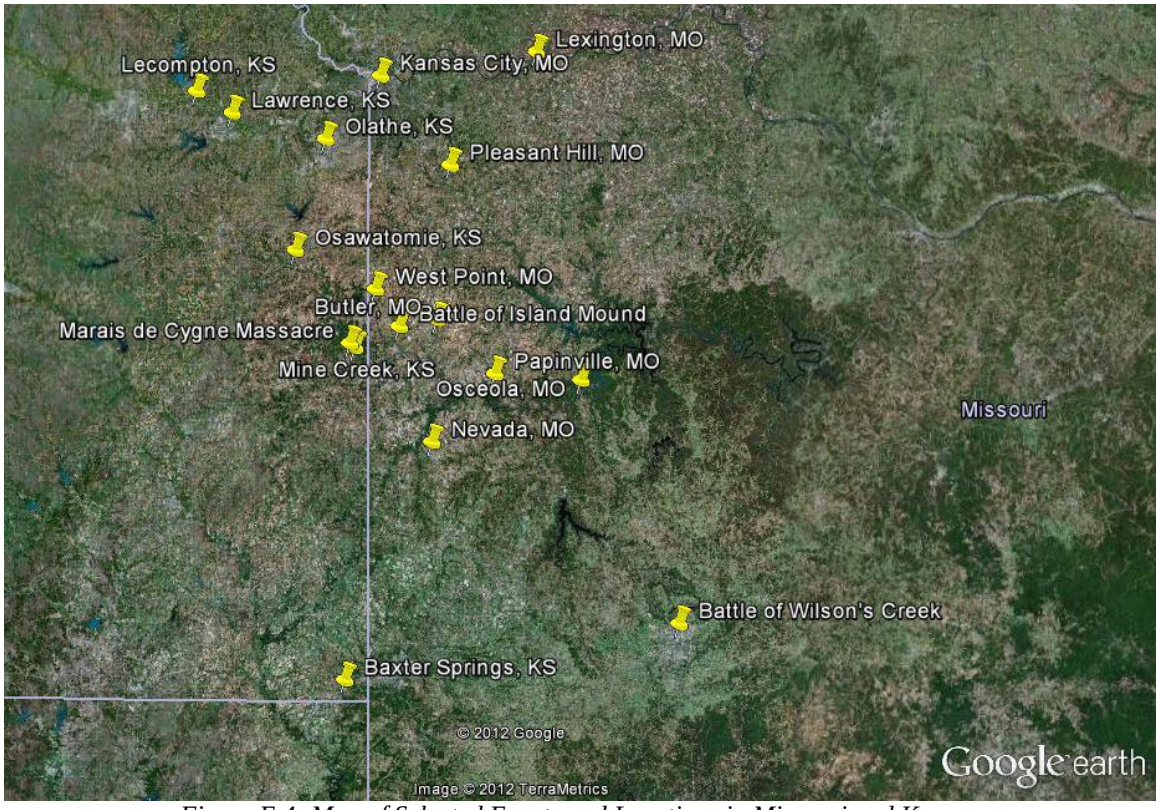



*Figure E.4: Map of Selected Events and Locations in Missouri and Kansas*

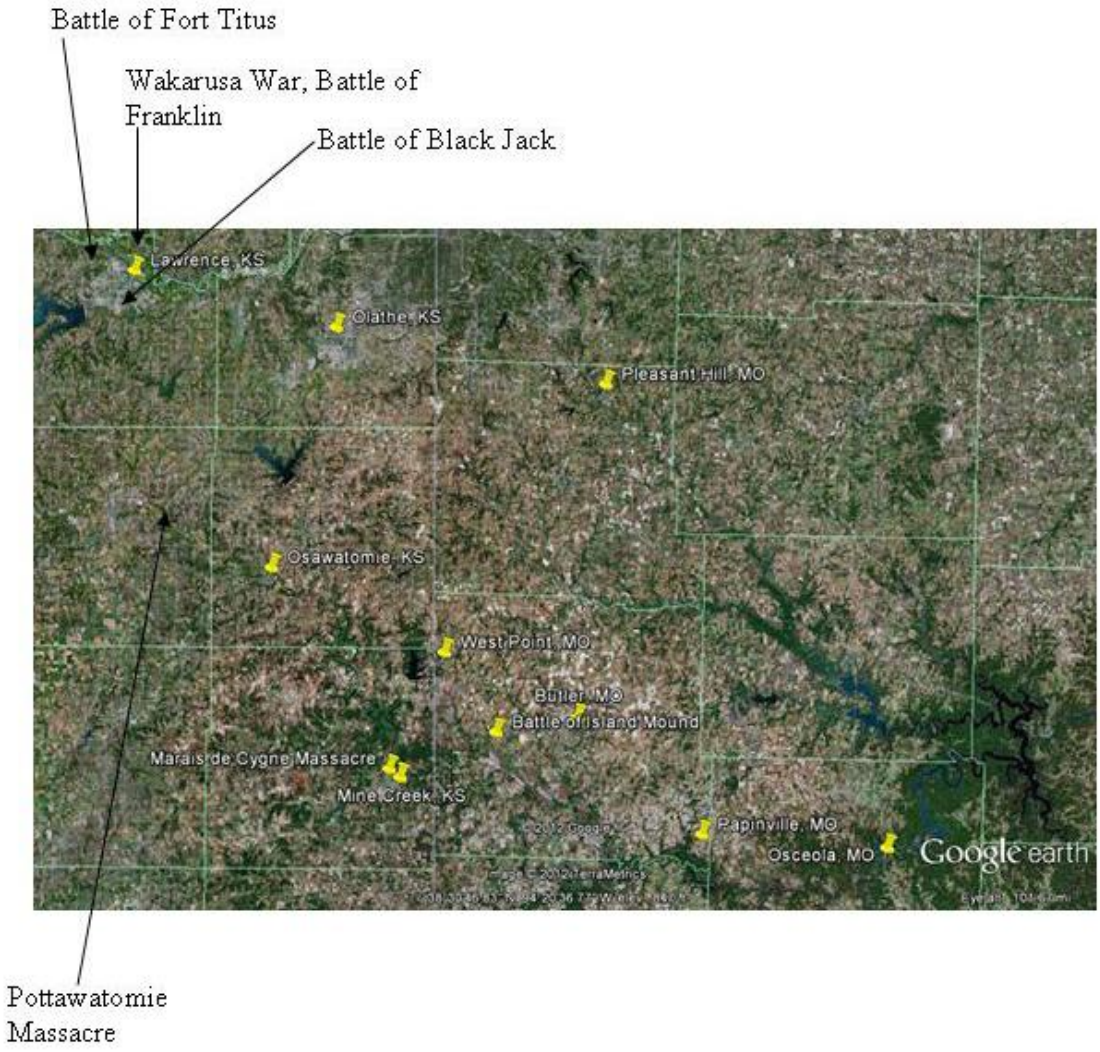



*Figure E.5: Map of Selected Events and Locations in Bates County and Adjacent Areas*

## Appendix F: Summary Tables of Selected Artifact Types

The following tables summarize the artifact assemblage found at both the Straub and Limpus sites. The assemblage from each level (0-10cm, 10-20cm, 20-30cm and 30-40cm) is sorted both by weight, and then by number of pieces (MNI was not always discernable). All weights are in grams. The included artifact categories are:

- Window glass
- Non-window glass
- Nails
- Misc. Fasteners (screws, bolts, nuts, etc.)
- Ceramics
- Gun Parts
- Ammunition
- Tin Can metal (only quantified by weight, not by number of pieces)
- Miscellaneous Metal
- Faunal

The entire artifact catalog is available as an Excel spreadsheet (Microsoft Office Excel 2003), and is on file at the Archaeological Research Center at the University of Kansas Biodiversity Institute (Spooner Hall). A detailed table of the window glass fragments included in the analysis is available in Appendix C. While not every artifact type is represented in these summary tables, the artifact types which are specifically referenced for the purpose of establishing chronology and/or socioeconomic status are included.

| Straub Site (23BT1128) Selected Artifact Summary By Weight (Grams) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Window Glass | Non-Window Glass | Nails | Misc. Fasteners | Ceramics | Gun Parts | Ammunition | Tin Can Metal | Misc. Metal | Faunal |
| 0-10 cm | 449.7 | 1874 | 1569.6 | 119.9 | 1907.3 | 0 | 18.5 | 92.9 | 2589.6 | 116.8 |
| 10-20cm | 1401.7 | 4864.4 | 2394.9 | 1034.7 | 2183 | 10.6 | 12.7 | 528.3 | 4520.6 | 40.1 |
| 20-30cm | 624.9 | 1629.7 | 316.6 | 27 | 2216 | 0 | 0.8 | 134.2 | 1345.7 | 18.7 |
| 30-40cm | 172.2 | 393.1 | 142.9 | 41.4 | 338.3 | 0 | 0 | 195.9 | 0 | 3 |

| Straub Site (23BT1128) Selected Artifact Summary By # of Pieces | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Window Glass | Non-Window Glass | Nails | Misc. Fasteners | Ceramics | Gun Parts | Ammunition | Tin Can Metal | Misc. Metal | Faunal |
| 0-10 cm | 379 | 1009 | 505 | 6 | 280 | 0 | 2 | N/A | 198 | 35 |
| 10-20cm | 902 | 2012 | 1092 | 42 | 514 | 3 | 8 | N/A | 334 | 124 |
| 20-30cm | 209 | 664 | 78 | 14 | 87 | 0 | 1 | N/A | 30 | 40 |
| 30-40cm | 84 | 283 | 57 | 11 | 64 | 0 | 0 | N/A | 0 | 26 |

*Table F.1: Summary of Selected Straub Site Artifacts*

| Limpus Site (23BT1129) Selected Artifact Summary By Weight (Grams) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Window Glass | Non-Window Glass | Nails | Misc. Fasteners | Ceramics | Gun Parts | Ammunition | Tin Can Metal | Misc. Metal | Faunal |
| 0-10 cm | 37.7 | 211.7 | 65.9 | 3.9 | 161.4 | 0 | 17.4 | 0.6 | 146.4 | 10.7 |
| 10-20cm | 223.9 | 1780.2 | 846.4 | 175.9 | 1784.3 | 0 | 47.6 | 61.6 | 757.7 | 158.8 |
| 20-30cm | 128.7 | 909 | 488.9 | 78.8 | 1166.9 | 3.5 | 13.5 | 11.3 | 351.3 | 164 |
| 30-40cm | 0.3 | 9.4 | 20.1 | 0 | 52.3 | 0 | 0 | 0 | 2.7 | 89.2 |

| Limpus Site (23BT1129) Selected Artifact Summary By # of Pieces | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Window Glass | Non-Window Glass | Nails | Misc. Fasteners | Ceramics | Gun Parts | Ammunition | Tin Can Metal | Misc. Metal | Faunal |
| 0-10 cm | 28 | 126 | 22 | 1 | 84 | 0 | 3 | N/A | 59 | 13 |
| 10-20cm | 164 | 989 | 301 | 25 | 321 | 0 | 12 | N/A | 163 | 143 |
| 20-30cm | 108 | 474 | 129 | 9 | 199 | 1 | 4 | N/A | 58 | 121 |
| 30-40cm | 1 | 5 | 6 | 0 | 19 | 0 | 0 | N/A | 2 | 25 |

*Table F.2: Summary of Selected Limpus Site Artifacts*

## References Cited


----.

1883 *The History of Cass and Bates Counties, Missouri*. St. Joseph, MO: The National History Company. Reprinted in 2006 by Hearthstone Legacy Publications, Higgingsville, MO.

2001 IMACS User's Guide: 470-Nails. http://www.anthro.utah.edu/IMACs/470-Nails.pdf (accessed 11/12/2011).

2006 *Bates County Maps*. Higginsville, MO: Hearthstone Legacy Publications.

2012 Convention for the Protection of Cultural Property in the Event of Armed Conflict with Regulations for the Execution of the Convention 1954. http://portal.unesco.org/en/ev.php-URL_ID=13637&URL_DO=DO_TOPIC&URL_SECTION=201.html (accessed 1/16/2012).

Adams, William Hampton

2002 "Machine Cut Nails and Wire Nails: American Production and Use for Dating 19th-Century and Early-20th-Century Sites," in *Historical Archaeology* 36(4): 66-88.

Archaeo-Physics

2007 http://www.archaeophysics.com (accessed 5/7/2007).

Arkush, Elizabeth N. and Mark W. Allen (eds.)

2006 *The Archaeology of Warfare: Prehistories of Raiding and Conquest*. Gainesville, FL: University Press of Florida.

Atkeson, W.O.

1918 *History of Bates County Missouri*. Topeka, KS: Historical Publishing Company.

Bagdade, Susan and Al Bagdade

1991 *Warman's English & Continental Pottery & Porcelain*, 2nd Edition. Iola, WI: Krause Publications.

Barber, Russell J.

1994 *Doing Historical Archaeology: Exercises Using Documentary, Oral, and Material Evidence*. Upper Saddle River, NJ: Prentice Hall.

Barry, Louise

1942 The Fort Leavenworth – Fort Gibson Military Road and the Founding of Fort Scott. In Kansas Historical Quarterly, Vol. XI, No. 1 (May, 1942), pp. 115-129

Bartels, Carolyn M.
1992 *The Civil War in Missouri Day by Day, 1861-1865*. Independence, MO: Two Trails Publishing.

Bates County – History of Bates County
N.D. http://www.batescounty.net/bates_county.htm (accessed 11/18/2007).

Bates County History Museum
1863 *Bates County Tax Records, 1863*. In the collection at the Bates County History Museum, Butler, MO.

Binford, Lewis R.
1978 "Evolution and Horizon as Revealed in Ceramic Analysis in Historical Archaelogy – A Step Toward the Development of Archaeological Science," in *Historical Archaeology: A Guide to Substantive and Theoretical Contributions* (pp. 246-250), Robert L. Schuyler, editor. Farmingdale, NY: Baywood Publishing Company, Inc.

Bowen, Joanne
1978 "Probate Inventories: An Evaluation from the Perspective of Zooarchaeology and Agricultural History at Mott Farm." In *Historical Archaeology: A Guide to Substantive and Theoretical Contributions*, ed. Robert L. Schuyler, 149-159. Farmingdale, NY: Baywood Publishing Company, Inc.

Bremer, Jeff Robert
2006 *Frontier Capitalism: The Market Revolution in the Antebellum Lower Missouri River Valley, 1803-1860*. Unpublished PhD Dissertation. Department of History, University of Kansas.

Brodie, N.
2006 "The plunder of Iraq's archaeological heritage, 1991–2005, and the London antiquities trade." In *Archaeology, Cultural Heritage, and the Antiquities Trade* (Brodie, N., Kersel, M. M., Luke, C., and Tubb, K. W. eds.). Gainesville: University Press of Florida, pp. 206–226

Bureau of Labor Statistics
1914 *Missouri Red Book – 1913*. Jefferson City, MO: Bureau of Labor Statistics.

Carlisle, Ronald C. and Joel Gunn
1977 "Idiosyncratic Behavior in the Manufacture of Handwrought Nails," in *Research Strategies in Historical Archaeology* (pp. 287-306), Stanley South, editor. New York, NY: Academic Press, Inc.

Carr, Christopher
1982 *Handbook on Soil Resistivity Surveying*. Evanston, Illinois: Center for American Archaeology Press.

Castel, Albert
2006 "Order No. 11 and the Civil War on the Border," in *The Civil War in Missouri: Essays from the Missouri Historical Review, 1906-2006*, William E. Parrish, ed. Columbia, MO: The State Historical Society of Missouri.

Ceramic Type Collection
2004 Historical Archaeology at the Florida Museum of Natural History. http://www.flmnh.ufl.edu/histarch/gallery_types/type_search.asp (accessed 11/20/2007).

Conyers, Lawrence B.
2004 *Ground-Penetrating Radar for Archaeology*. Walnut Creek, CA: Altamira Press.

Creamer, Winifred
2001 The Origins of Centralization: Changing Features of Local and Regional Control During the Rio Grande Classic Period, A.D. 1325-1540. In, *Leaders to Rulers*, edited by Jonathan Haas, pp. 37-58. New York, Plenum Press.

Dawdy, S.L.
2008 "Excavating the present, vindicating the dead." In *Historical Archaeology* 42(2): 152–156.

Day, Grant L.
2001 Window Glass Dating: When was McConnell's Homestead Built? Paper presented at the 4th Annual Meeting South Central Historical Archaeology Conference, Little Rock Arkansas.

Deetz, James
1996 *In Small Things Forgotten: An Archaeology of Early American Life* (expanded and revised edition). New York, NY: Random House.

Demarest, Arthur A.
2006 *The Petexbatun Regional Archaeological Project: A Multidisciplinary Study of the Maya Collapse*. Vanderbilt University Press, Nashville, TN.

Diamond, Jared
2005 *Collapse: How Societies Choose to Fail or Succeed*. Penguin Books, New York, NY.

Dollar, Clyde
1968 "Some Thoughts on Theory and Method in Historical Archaeology." In *The Conference on Historic Site Archaeology Papers 1967* (Stanley South, Editor), Volume 2, Part 2, pp. 3-30.

Dolphin, Lambert.
N.D. How Geophysical Methods Can Help the Archaeologist. http://www.ldolphin.org/Geoarch.html. (accessed 5/10/2007)

Drucker, Lesley M., Woody C. Meiszner and James B. Legg
1982 "The Banister Allen Plantation (38Ab102) and Thomas B. Clinkscales Farm (38Ab221): Data Recovery in the Richard B. Russell Multiple Resource Area, Abbeville County, South Carolina," in *Resource Studies*, No. 55. Carolina Archaeological Services, Columbia, South Carolina.

Eakin, Joanne Chiles
1996 *Tears and Turmoil: Order Number 11*. Independence, MO: Two Trails Publishing.

Ember, Carol R. and Melvin Ember
1997 Violence in the Ethnographic Record: Results of Cross-Cultural Research on War and Aggression. In *Troubled Times: Violence and Warfare in the Past* (pp. 1-20), Debra L. Martin and David W. Frayer, editors. Amsterdam, The Netherlands: Gordon and Breach Publishers.

Etcheson, Nicole
2004 *Bleeding Kansas: contested Liberty in the Civil War Era*. Lawrence, KS: University Press of Kansas.

Fellman, Michael
1989 *Inside War: The Guerrilla Conflict in Missouri During the American Civil War*. New York, NY: Oxford University Press.

Ferguson, R. Brian
1997 Violence and War in Prehistory. In *Troubled Times: Violence and Warfare in the Past* (pp. 321-355), Debra L. Martin and David W. Frayer, editors. Amsterdam, The Netherlands: Gordon and Breach Publishers.

Fisher, Alyssa
2003 A Sight Which Can Never Be Forgotten. In *Archaeology*, Online Features. September 16, 2003. http://www.archaeology.org/online/features/massacre/index.html (accessed 4/10/2012).

Foley, William E.
1999 *A History of Missouri: Volume I, 1673-1820*. Columbia, MO: University of Missouri Press.

Geier Jr., Clarence R. and Susan E. Winter (editors)
1994 *Look to the Earth: Historical Archaeology and the American Civil War*. Knoxville, TN: University of Tennessee Press.

Gerlach, Russel L.
1986 *Settlement Patterns in Missouri: A Study of Population Origins*. Columbia, MO: University of Missouri Press.

Gilchrist, Roberta
2003 Introduction: Towards a Social Archaeology of Warfare. *World Archaeology* 35(1): 1-6.

Gilmore, Donald L.
2006 *Civil War on the Missouri-Kansas Border*. Gretna, LA: Pelican Publishing Company, Inc.

Glassie, Henry
1977 "Archaeology and Folklore: Common Anxieties, Common Hopes." In *Historical Archaeology and the Importance of Material Things*, ed. Leland Ferguson, 23-35. The Society for Historical Archaeology.

Glassmire, Fern and Jeanie Thornton
1991 *Ghost Towns in Bates County, Missouri*. No publisher, Bates County, Missouri.

Gluckman, Arcadi
1965 *Identifying Old U.S. Muskets, Rifles, and Carbines*. Bonanza Books: New York, NY.

Goodrich, Thomas
1995 *Black Flag: Guerrilla Warfare on the Western Border, 1861-1865*. Bloomington, IN: University of Indiana Press.

Goody, J.
2006 *The Theft of History*. Cambridge: Cambridge University Press.

Haas, Jonathan (editor)
1990 *The Anthropology of War*. New York, NY: Cambridge University Press.
2001 *From Leaders to Rulers*. New York, NY: Kluwer Academic/Plenum Publishers.

Hackley, F.W., W.H. Woodin, and E.L. Scranton
1967 *History of Modern U.S. Military Small Arms Ammunition*. Macmillan: New York, NY.

Harrington, J.C.
1978 "Archaeology as an Auxiliary Science to American History," in *Historical Archaeology: A Guide to Substantive and Theoretical Contributions* (pp. 3-7), Robert L. Schuyler, editor. Farmingdale, NY: Baywood Publishing Company, Inc.

Hicks, James E.
1940 *Notes on United States Ordnance, Volume 1, Small Arms, 1776 to 1940*. James E. Hicks: Mount Vernon, NY.

Hicks, James E.
1961 *U.S. Military Firearms, 1776-1956*. James Hicks and Sons: LaCañada, CA.

Historical Census Browser
2004 The University of Virginia, Geospatial and Statistical Data Center: http://fisher.lib.virginia.edu/collections/stats/histcensus/index.html (Retrieved 10/28/2007)

Hogg, Ian V.
1985 *The Illustrated Encyclopedia of Ammunition*. Chartwell Books, Inc.: Secaucas, NJ.

Holt, Glen E.
1982 "Chicago Through a Camera Lens: An Essay on Photography as History." In *Material Culture Studies in America*, ed. Thomas J. Schlereth, 278-288. Nashville, TN: The American Association for State and Local History.

Horn, Warren R.
1962 *Headstamps and Cartridge Identification Guide*. The Sheldon Press:, Burlington VT.

Hoyem, George A.
1981 *Historical Development of Small Arms Ammunition* (3 vols.). Armory Publications: Tacoma, WA.

Hume, Ivor Noël
1969a *A Guide to Artifacts of Colonial America*. Philadelphia, PA: University of Pennsylvania Press.

1969b *Historical Archaeology: A Comprehensive Guide for Both Amateurs and Professionals to the Techniques and Methods of Excavating Historical Sites*. New York, NY: Alfred A. Knopf.

Hurt, R. Douglas
1992 *Agriculture and Slavery in Missouri's Little Dixie*. Columbia, MO: University of Missouri Press.

Jeppson, P.L.
2006 "Which Benjamin Franklin—Yours or Mine? Examining Responses to a New Story from the Historical Archaeology site of Franklin Court." In *Archaeologies* 2(2): 24–51.

Joes, Anthony James
1996 *Guerrilla Conflict Before the Cold War*. Praeger Publishers: Westport, CT.

Jurney, David H.
1987a "Cut and Wire Nails: Functional and Temporal Interpretations." In *Pioneer Settlers, Tenant Farmers, and Communities: Richland Creek Technical Series, Vol. V*, ed. Randall W. Moir and David H. Jurney, 83-96. Archaeological Research Program, Institute for the Study of Earth and Man: Southern Methodist University.
1987b "Faunal Analysis: Clues to Diet and Site Formation Processes." In *Pioneer Settlers, Tenant Farmers, and Communities: Richland Creek Technical Series, Vol. V*, ed. Randall W. Moir and David H. Jurney, 143-153. Archaeological Research Program, Institute for the Study of Earth and Man: Southern Methodist University.
1987c "Methods for Architectural Documentation." In *Pioneer Settlers, Tenant Farmers, and Communities: Richland Creek Technical Series, Vol. V*, ed. Randall W. Moir and David H. Jurney, 1-5. Archaeological Research Program, Institute for the Study of Earth and Man: Southern Methodist University.
1987d "Trends in the Architectural Record." In *Pioneer Settlers, Tenant Farmers, and Communities: Richland Creek Technical Series, Vol. V*, ed. Randall W. Moir and David H. Jurney, 41-54. Archaeological Research Program, Institute for the Study of Earth and Man: Southern Methodist University.

Jurney, David H. and Billie S. Glaspy (with contributions by T. Reed Lee, Randall Moir and Joe W. Saunders)
1987 "Settlement and Notable Events Along Richland Creek." In *Pioneer Settlers, Tenant Farmers, and Communities: Richland Creek Technical Series, Vol. IV*, ed. Randall W. Moir and David H. Jurney, 39-52. Archaeological Research Program, Institute for the Study of Earth and Man: Southern Methodist University.

Jurney, David H., Randall W. Moir and William A. Westbury
1987 "Appendix D: The Written Word: Expectations and Realizations." In *Pioneer Settlers, Tenant Farmers, and Communities: Richland Creek Technical Series, Vol. V*, ed. Randall W. Moir and David H. Jurney, 293-304. Archaeological Research Program, Institute for the Study of Earth and Man: Southern Methodist University.

Keeley, Lawrence H.
1996 *War Before Civilization: The Myth of the Peaceful Savage*. New York, NY: Oxford University Press.
1997 Frontier Warfare in the Early Neolithic. In *Troubled Times: Violence and Warfare in the Past* (pp. 303-319), Debra L. Martin and David W. Frayer, editors. Amsterdam, The Netherlands: Gordon and Breach Publishers.

Kniffen, Fred and Henry Glassie
1982 "Building in Wood in the Eastern United States: A Time-Place Perspective." In *Material Culture Studies in America*, ed. Thomas J. Schlereth, 237-250. Nashville, TN: The American Association for State and Local History.

Kovel, Ralph and Terry Kovel
1986 *Kovels' New Dictionary of Marks: Pottery & Porcelain 1850 to the Present*. New York, NY: Random House Reference
1995 *Kovels' Dictionary of Marks: Pottery & Porcelain 1650 to 1850*. New York, NY: Random House Reference

Kvamme, Kenneth L.
2003 Geophysical surveys as landscape archaeology. *American Antiquity* 68 (3): 435-457.

LeBlanc, Steven A.
1999 *Prehistoric Warfare in the American Southwest*. Salt Lake City, UT: The University of Utah Press.

Lebo, Susan A.
1987a "Local Utilitarian Stonewares: A Diminishing Artifact Category." In *Pioneer Settlers, Tenant Farmers, and Communities: Richland Creek Technical Series, Vol. V*, ed. Randall W. Moir and David H. Jurney, 121-142. Archaeological Research Program, Institute for the Study of Earth and Man: Southern Methodist University.
1987b "Low Frequency Material: Personal, Household, and Farm Items. In *Pioneer Settlers, Tenant Farmers, and Communities: Richland Creek Technical Series, Vol. V*, ed. Randall W. Moir and David H. Jurney, 155-187. Archaeological Research Program, Institute for the Study of Earth and Man: Southern Methodist University.
1987c "Rural Industry and Industrial Sites." In *Pioneer Settlers, Tenant Farmers, and Communities: Richland Creek Technical Series, Vol. IV*, ed. Randall W. Moir and David H. Jurney, 149-170. Archaeological Research Program, Institute for the Study of Earth and Man: Southern Methodist University.

Lees, William B.
1999 Archaeological Evidence for the United States' 1868 Attack on Black Kettle's Village. In *Journal of the Indian Wars* 1(1): 33-42.
1991 Archaeology Yields Secrets of Mine Creek Battle. In *Kansas Preservation* 13(5): 1-3.

Lehner, Lois
1988 *Lehner's Encyclopedia of U.S. Marks on Pottery, Porcelain & Clay*. Paducah, KY: Collector Books (A Division of Schroeder Publishing Co., Inc.)

Leslie, Edward E.
1998 *The Devil Knows How to Ride: The True Story of William Clarke Quantrill and His Confederate Raiders*. New York, NY: Da Capo Press.

Lewis, Berkeley R.
1960 *Small Arms and Ammunition in the United States Service, 1776-1865*. Smithsonian Institution: Washington, D.C.
1972 *Small Arms Ammunition at the International Exposition Philadelphia, 1876*. Smithsonian Institution, Washington, D.C.

Lewis, Kenneth E.
1977 "Sampling the Archeological Frontier: Regional Models and Component Analysis," in *Research Strategies in Historical Archaeology* (pp. 151-202), Stanley South, editor. New York, NY: Academic Press, Inc.

Library of Congress
1820 "Transcript of Letter: Thomas Jefferson to John Holmes, April 22, 1820." Library of Congress, http://www.loc.gov/exhibits/jefferson/159.html (accessed February 24, 2008).

Lightfoot, Kent G., Antoinette Martinez and Ann M. Schiff
1998 "Daily Practice and Material Culture in Pluralistic Social Settings: An Archaeological Study of Culture Change and Persistence from Fort Ross, California," in *American Antiquity* 63(2): 199-222.

Little, Barbara J.
2007 *Historical Archaeology: Why the Past Matters*. Walnut Creek, CA: Left Coast Press.

Manson, Joni L. and David M. Snyder
1996 *Evaluating Sites with Late Nineteenth or Early Twentieth Century Components for Eligibility in the National Register of Historic Places: Using Turn-of-the-Century Whitewares as Economic Indicators in Assessing Collections and Developing Contexts*. Report developed under a grant from the National Park Service and the National Park Center for Preservation Technology and Training (NCPTT Grant Number: MT-0424-5-NC-019).

Martin, Debra L.
1997 Violence Against Women in the La Plata River Valley (A.D. 1000-1300). In *Troubled Times: Violence and Warfare in the Past* (pp. 45-75), Debra L. Martin and David W. Frayer, editors. Amsterdam, The Netherlands: Gordon and Breach Publishers.

Martin, Edgar W.
1942 *The Standard of Living in 1860 – American Consumption Levels on The Eve of the Civil War*. Chicago, IL: The University of Chicago Press.

Maschner, Herbert D. G.
1997 The Evolution of Northwest Coast Warfare. in *Troubled Times: Violence and Warfare in the Past* (pp. 267-302), Debra L. Martin and David W. Frayer, editors. Amsterdam, The Netherlands: Gordon and Breach Publishers.

Matunas, Edward
1979 *American Ammunition and Ballistics*. Winchester Press: Tulsa, OK.

McCandless, Perry
1971 *A History of Missouri: Volume II, 1820 to 1860*. Columbia, MO. University of Missouri Press.

McCarthy, Todd
1999 "Ride With the Devil" (Film Review). In *Variety*, Sept. 12, 1999.

McGuire, Randall
2004 Letter From Ludlow: Colorado Coalfield Massacre. In *Archaeology*, Volume 57, Number 6, November/December 2004.

Miller, George L.
1980 "Classification and Economic Scaling of 19th Century Ceramics," in *Historical Archaeology* 14(1): 1-40.
1991 "A Revised Set of CC Index Values for Classification and Economic Scaling of English Ceramics from 1787 to 1880," in *Historical Archaeology* 25(1): 1-25.

Mink, Charles R.
1970 "General Orders, No. 11: The Forced Evacuation of Civilians During the Civil War," in *Military Affairs* 34(4): 132-137.

Moir, Randall
1987a "Refined Earthwares and Rural Ceramic Traditions." In *Pioneer Settlers, Tenant Farmers, and Communities: Richland Creek Technical Series, Vol. V*, ed. Randall W. Moir and David H. Jurney, 97-120. Archaeological Research Program, Institute for the Study of Earth and Man: Southern Methodist University.
1987b "Socioeconomic and Chronometric Patterning of Window Glass." In *Pioneer Settlers, Tenant Farmers, and Communities: Richland Creek Technical Series, Vol. V*, ed. Randall W. Moir and David H. Jurney, 73-81. Archaeological Research Program, Institute for the Study of Earth and Man: Southern Methodist University.
1987c "Strategies for Systematic Excavations." In *Pioneer Settlers, Tenant Farmers, and Communities: Richland Creek Technical Series, Vol. IV*, ed. Randall W. Moir and David H. Jurney, 53-68. Archaeological Research Program, Institute for the Study of Earth and Man: Southern Methodist University.

1987d "Trends in the Archaeological Record." In *Pioneer Settlers, Tenant Farmers, and Communities: Richland Creek Technical Series, Vol. IV*, ed. Randall W. Moir and David H. Jurney, 171-179. Archaeological Research Program, Institute for the Study of Earth and Man: Southern Methodist University.

Moir, Randall, Melissa M. Green and Susan A. Lebo
1987 "Appendix C: Historic Artifact Classification." In *Pioneer Settlers, Tenant Farmers, and Communities: Richland Creek Technical Series, Vol. V*, ed. Randall W. Moir and David H. Jurney, 269-291. Archaeological Research Program, Institute for the Study of Earth and Man: Southern Methodist University.

Moir, Randall and David H. Jurney
1987 "Farmstead Site Descriptions." In *Pioneer Settlers, Tenant Farmers, and Communities: Richland Creek Technical Series, Vol. IV*, ed. Randall W. Moir and David H. Jurney, 69-148. Archaeological Research Program, Institute for the Study of Earth and Man: Southern Methodist University.

Monaghan, Jay
1984 *Civil War on the Western Border, 1854-1865*. Lincoln, NE: University of Nebraska Press.

Mutti-Burke, Diane
2004 *On Slavery's Borders: Slavery and Slaveholding on Missouri's Farms, 1821-1865*. Unpublished Dissertation, Emory University.

Neely, Jeremy
2000 *Bates County, Missouri: The Transformation of a Middle Western Frontier, 1855-1895*. Unpublished MA Thesis. Department of History, University of Missouri.
2004 *Divided in the Middle: A History of the Kansas-Missouri Border, 1854-1896*. Unpublished Dissertation, Department of History. Univeristy of Missouri: Columbia, MO.
2007 *The Border Between Them: Violence and Reconciliation on the Kansas-Missouri Line*. Columbia, MO: University of Missouri Press.

Nichols, Roy F.
1956 "The Kansas-Nebraska Act: A Century of Historiography." *Mississippi Valley Historical Review* 43 (September 1956): 187-212.

O'Brien, Michael J., Roger D. Mason and Jacqueline E. Saunders
1982 "The Structure of Historic Communities," in *The Cannon Reservoir Human Ecology Project*, edited by M.J. O'Brien, R.E. Warren and D.E. Lewarch, pp. 301-334. New York, NY: Academic Press.

Orser, Jr., Charles E.
2010 "Twenty-First-Century Historical Archaeology," in *Journal of Archaeological Research* 18:111-150.

Orser, Jr., Charles E. and Brian M. Fagan
1995 *Historical Archaeology*. New York, NY: Prentice Hall.

Otto, John Solomon
1975 *Status Differences and the Archaeological Record – A Comparison of Planter, Overseer, and Slave Sites from Cannon's Point Plantation (1794-1861), St. Simon's Island, Georgia.* Unpublished PhD Dissertation. Department of Anthropology, University of Florida.
1977 *Artifacts and Status Differences* – "A Comparison of Ceramics from Planer, Overseer, and Slave Sites on an Antebellum Plantation," in *Research Strategies in Historical Archaeology* (pp. 91-118), Stanley South, editor. New York, NY: Academic Press, Inc.

Petersen, Paul R.
2003 *Quantrill of Missouri: The Making of a Guerrilla Warrior*. Nashville, TN: Cumberland House Publishing, Inc.

Potter, David M.
1977 The Impending Crisis: America Before the Civil War 1848-1861. Harper Perennial.

Price, Cynthia R.
1979 *19th Century Ceramics…in the Eastern Ozark Border Region*. Springfield, MO: Center for Archaeological Research.

Resnick, Benjamin
1988 "The Williams Place: A Scotch-Irish Farmstead in the South Carolina Piedmont," in *Volumes in Historical Archaeology III,* Stanley South, editor. Columbia, SC: South Carolina Institute of Archaeology and Anthropology.

Robbins, Eloise Frisbie
1978 "The Original Military Post Road Between Fort Leavenworth and Fort Scott," in *Kansas History* 1(2): 90-100.

Saitta, Dean J.
2009 Why We Dig: Archaeology, Ludlow and the Public. In *The Archaeology of Class War*, edited by K. Larkin and R. McGuire, pp. 351-362. University Press of Colorado.
2004 Desecration at Ludlow. In *New Labor Forum,* 13:84-87.
2002 The Colorado Coal Field War Archaeology Project. In *The SAA Archaeological Record*, 2(2):21-23 (with the Ludlow Collective).

Schoen, Christopher M.
1990 "Window Glass on the Plains: an Analysis of Flat Glass Samples from Ten Nineteenth Century Plains Historic Sites," in *Central Plains Archaeology* 2(1): 57-90.

Schuyler, Robert L.
1978 "Historical and Historic Sites Archaeology as Anthropology: Basic Definitions and Relationships," in *Historical Archaeology: A Guide to Substantive and Theoretical Contributions* (pp. 3-7), Robert L. Schuyler, editor. Farmingdale, NY: Baywood Publishing Company, Inc.

Scollar, I., A. Tabbagh, A. Hesse and I. Herzog
1990 *Archaeological Prospecting and Remote Sensing*. Cambridge: Cambridge University Press.

Scott, Douglas D., Richard A. Fox, Jr., Melissa A. Connor and Dick Harmon
2000 *Archaeological Perspectives on the Battle of the Little Big Horn.* University of Oklahoma Press.

Scott, Douglas D. and Andrew P. McFeaters
2011 "The Archaeology of Historic Battlefields: A History and Theoretical Development in Conflict Archaeology," in *Journal of Archaeological Research* 19:103-132.

SenGupta, Gunja
2001 "Bleeding Kansas: A Review Essay." *Kansas History* 24 (Winter 2001/2002): 318-341.

Shackel, P.A.
2000 *Archaeology and Created Memory: Public History in a National Park.* New York: Kluwer Academic/Plenum.
2001 "Public Memory and the Search for Power in American Historical Archaeology." In *American Anthropologist* 103: 655–670.

Singleton, T.A., and Orser, C.E., Jr.
2003 "Descendant Communities: Linking People in the Present to the Past." In *Ethical Issues in Archaeology* (Zimmerman, L.J., Vitelli, K.D., and Hollowell-Zimmer, J., eds), pp. 143-152. Walnut Creek, CA: AltaMira.

South Stanley
1968 "Comment on "Some Thoughts on Theory and Method in Historical Archaeology" by Clyde Dollar." In *The Conference on Historic Site Archaeology Papers 1967*, Volume 2, Part 2, pp. 35-53.
1977 *Method and Theory in Historical Archaeology.* Clinton Corners, NY: Percheron Press.

1978a "Evolution and Horizon as Revealed in Ceramic Analysis in Historical Archaeology." In *Historical Archaeology: A Guide to Substantive and Theoretical Contributions*, ed. Robert L. Schuyler, 68-82. Farmingdale, NY: Baywood Publishing Company, Inc.

1978b "Exploring Analytical Techniques." In *Historical Archaeology: A Guide to Substantive and Theoretical Contributions*, ed. Robert L. Schuyler, 253-266. Farmingdale, NY: Baywood Publishing Company, Inc.

1989 "Using Scientific Methodology and Energy Theory to Address Artifacts from British and Spanish Colonial Communities," in *Households and Communities: Proceedings of the 21st Annual Chacmool Conference* (pp. 3-12), edited by Scott MacEachern, David J. W. Archer and Richard D. Garvin. The Archaeological Association of the University of Calgary.

2002 *Archaeological Pathways to Historic Site Development*. New York, NY: Kluwer Academic/Plenum Publishers.

South, Stanley and Randolph Widmer

1977 "A Subsurface Sampling Strategy for Archaeological Reconnaissance." In *Research Strategies in Historical Archaeology*, ed. Stanley South, 119-150. New York, NY: Academic Press.

Stanley-Price, Nicholas (Editor)

2006 *Cultural Heritage in Postwar Recovery: Papers from the ICCROM Forum Held on October 4-6, 2005*. ICCROM Conservation Studies 6. Rome, Italy: ICCROM.

Tabor, Chris

2001 *The Skirmish at Island Mound, Mo: The First Battle by an African-American Regiment during the Civil War.* The Blue and Grey Book Shoppe, Independence, Missouri.

The State Historical Society of Missouri

N.D. Missouri Newspapers on Microfilm. http://shs.umsystem.edu/newspapercatalog/batescounty.shtml (accessed 12/12/2007).

Trinkley, Michael B. and Olga Caballero

1983 *An Archaeological and Historical Evaluation of the I-85 Northern Alternative, Spartanburg County, South Carolina*. South Carolina Department of Highways and Public Transportation, Columbia, South Carolina.

Turner, Christy G. and Jacqueline Turner

1998 *Man Corn: Cannibalism and Violence in the Prehistoric American Southwest*. University of Utah Press, Salt Lake City, UT.

Unknown
1971 *American Industry and Manufactures in the 19th Century: A Basic Source Collection*. Compiled from U.S. Government documents. Elmsford, NY: Maxwell Reprint Co.
1995 *Soil Survey of Bates County, Missouri*. United States Department of Agriculture, in cooperation with Missouri Agricultural Experiment Station.

United States Department of the Interior – Bureau of Land Management
2008 Historic Glass Bottle Identification & Information Website. http://www.sha.org/bottle/index.htm (accessed 3/23/2008).

Waselkov, Gregory A. and R. Eli Paul
1981 Frontiers and Archaeology. In *North American Archaeologist*, Vol. 2(4), 1980-81.

Weiland, Jonathan
2009 A Comparison and Review of Window Glass Analysis Approaches in Historical Archaeology. *Technical Briefs in Historical Archaeology* 4:29-40.

Wilson, David R.
1982 *Air Photo Interpretation for Archaeologists*. London: B.T. Batsford, Ltd.

Wilson, Rex L.
1981 *Bottles on the Western Frontier*. University of Arizona Press.

Wobst, H. Martin
1978 "The Archaeo-Ethnology of Hunter-Gatherers or the Tyranny of the Ethnographic Record in Archaeology," in *American Antiquity* 43(2): 303-309.